CCD-FX430/FX435/FX530/FX630
RMT-708

SERVICE MANUAL

US Model
CCD-FX430/FX435/FX530/FX630
Canadian Model
CCD-FX430/FX630

12x
SteadyShot
SONY
Video 8
Handycam
POWER
FOCUS
MANUAL
AUTO
STEADY SHOT
PROGRAM
AE

Photo : CCD-FX630

Video 8
Handycam

A MECHANISM

In this service manual, board names will be different for each model and indicated as follows.

	FX430/FX435/FX630	FX530
VC BOARD	VC-143 BOARD	VC-142 BOARD
VS BOARD	VS-110 BOARD	VS-111 BOARD
DD BOARD	DD-64 BOARD	DD-65 BOARD

For MECHANISM ADJUSTMENTS, refer to the "8 mm Video MECHANICAL ADJUSTMENT MANUAL Ⅳ" (9-973-199-11).

SPECIFICATIONS

Video Camera Recorder

System

Video recording system:
Two rotary heads, Helical scanning FM system
Audio recording system:
Rotary heads, FM system
Video signal:
NTSC color, EIA standards
Usable cassette: 8 mm video format cassette (standard 8 mm)
Tape speed: <SP mode>
Approx. 19/32 inches (1.43 cm)/second, <LP mode>
Approx. 5/16 inches (0.72 cm)/second (playback only)
Recording time:
<SP mode> 2 hours (P6-120)
Playback time:
<SP mode> 2 hours (P6-120),
<LP mode> 4 hours (P6-120)
Fastforward/rewind time:
Approx. 6 min. 30 sec. (P6-120)
Image device:
CCD (Charge Coupled Device)
Viewfinder: Electronic viewfinder (monochrome)
Lens: Combined 12 x power, Filter diameter 2 1/8 inches (52 mm), TTL autofocus system, inner focus wide macro system
Focul distance: See the table below.
Color temperature: Auto
Minimum illumination:
See the table below.
Illumination range:
See the table below.
Recommended illumination:
More than 100 lux

Output connector

Video output:
Phono jack, 1 Vp-p, 75 Ω, unbalanced, sync negative
Audio output:
See the table below.
RFU DC OUT:
Special minijack, DC 5 V
Earphone/headphones jack:
See the table below.
LANC control jack:
Stereo mini-minijack (ø 2.5 mm)
MIC jack: See the table below.

General

Power requirements: On battery mounting surface 6.0 V (battery pack), 7.5 V (AC power adaptor)
Average power consumption:
See the table below.
Installation: Vertically, horizontally
Operating temperature 32°F to 104°F (0°C to 40°C)
Storage temperature: −4°F to +140°F (−20°C to +60°C)
Dimensions: Approx.
4 3/4 x 4 3/8 x 10 1/4 inches (120 x 111 x 260 mm) (w/h/d)
Mass: See the table below.
Microphone: See the table below.

— Continued on next page —

8 VIDEO CAMERA RECORDER

SONY®

MICROFILM

	CCD-FX430	CCD-FX435	CCD-FX530	CCD-FX630	Notes
Focal distance	7/32 — 2 5/8 inches (5.4 — 64.8 mm)				9/32 — 3 1/8 inches (6.5 — 78 mm) when recording (**CCD-FX630** only)
	1 9/16 — 18 1/2 inches (39 — 468 mm)				When converted to a 35 mm still camera 1 7/8 — 22 1/4 inches (47 — 564 mm) when recording (**CCD-FX630** only)
Minimum illumination	2 lux			5 lux	F 1.8
Illumination range	2 lux to 100,000 lux			5 lux to 100,000 lux	—
Audio output	Monaural		2: stereo L and R	Monaural	Phono jacks 7.5 dBs, (at output impedance 47 kΩ) impedance less than 2.2 kΩ
Earphone/-headphones jack	Minijack		Stereo minijack	Minijack	—
MIC jack	Minijack		Stereo minijack	Minijack	–66 dBs low impedance with 2.5 to 3.0 V DC, output impedance 6.8 kΩ (ø 3.5 mm)
Mass	1 lb 15 oz (870 g)		1 lb 15 oz (880 g)	1 lb 15 oz (890 g)	Excluding the battery pack, lithium battery, cassette and shoulder strap
	2 lb 6 oz.(1,090 g)		2 lb 7 oz (1,100 g)	2 lb 7 oz (1,110 g)	Including the battery pack NP-55, lithium battery CR2025, cassette P6-120, and shoulder strap
Average power consumption	4.9 W		5.0 W	5.4 W	During camera recording including the viewfinder.
Microphone	Monaural type		Stereo type	Monaural type	Electret condenser microphone

AC power adaptor

Power requirements:
110 — 240 V AC*, 50/60 Hz
Power consumption:
See the table below.

Output voltage:
<DC OUT> See the table below.
<Battery charge terminal>
10 V, 1.1 A in charge mode

Application:
Sony battery packs NP-55/55H, NP-60D, NP-66H, NP-77H, NP-80/80D
Operating temperature:
32°F to 104°F
(0°C to 40°C)

Storage temperature:
–4°F to +140°F
(–20°C to +60°C)
Dimensions:
Approx.
4 1/8 x 1 15/16 x 2 1/2 inches
(103 x 49 x 63 mm) (w/h/d)
including projecting parts and controls
Mass:
See the table below.

	AC-V25	AC-V25A	AC-V25B	Notes
Power consumption	15 W	17 W	17 W	—
Output voltage	7.5 V, 1.2 A	7.5 V, 1.5 A	7.5 V, 1.5 A	DC OUT in operating mode
Mass	10 oz (290 g)	11 oz (320 g)	10 oz (290 g)	—

* Canadian Standard Association (CSA) certifies 120 V AC only.

Design and specifications are subject to change without notice.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.
6. Flexible Circuit board Repairing
    - Keep the temperature of the soldering iron around 270°C during repairing.
    - Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
    - Be careful not to apply force on the conductor when soldering or unsoldering.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

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There is the color reproduction standard frame at the back of the book.

SERVICE NOTE

[SEMICONDUCTOR FOR CORRECTION LIST DISPLAY]

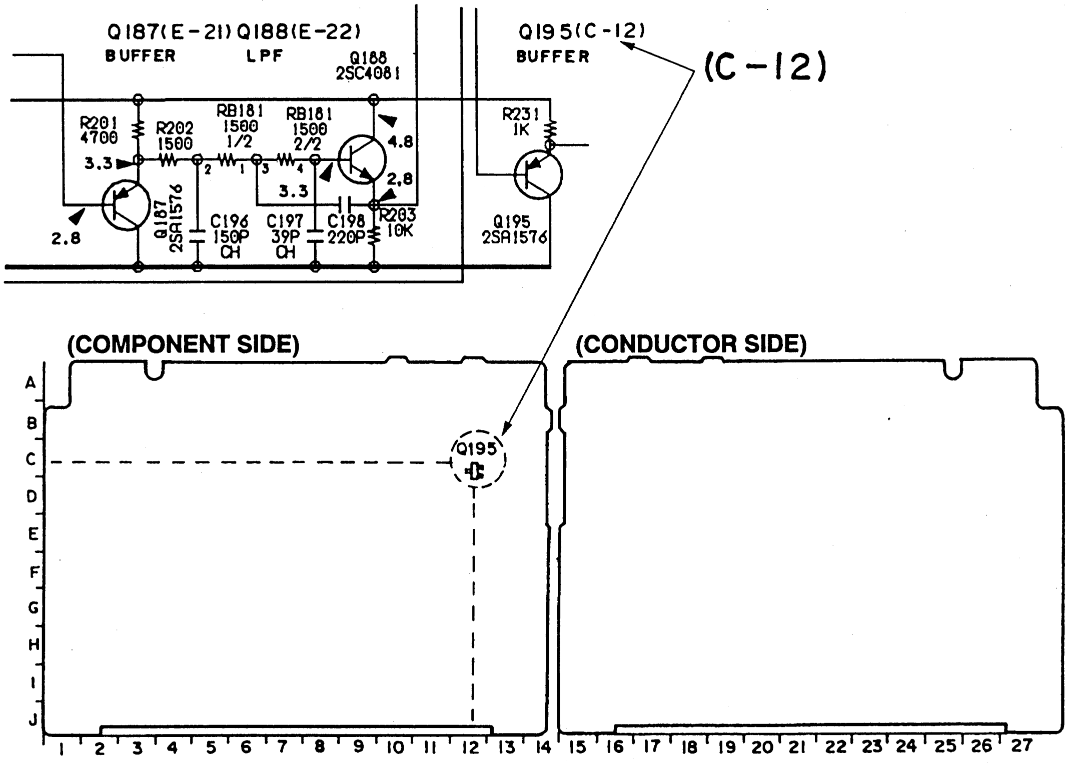
Part code and part name of the semiconductor for correction of the print board is discribed in the space of each print figure. Use this list when ordering parts.

[PARTS LOCATION DIAGRAM RELATED TO POWER SUPPLY]

The parts location diagram for the power supply which are often checked and replaced when repairing the fuse and IC link and so on. (See page 4–24, 4–35 and 4–36.)
This diagram is useful for repair.

[SEMICONDUCTOR LOCATION]

In this service manual, the mounted locations of the semiconductors (IC, transistor, diodes) are indicated in red in schematic diagrams. This enables to find the location on the board easily when servicing.



Q187(E-21) Q188(E-22)
BUFFER
LPF
Q188
2SC4081
R201
4700
R202
1500
RB181
1500
1/2
RB181
1500
2/2
4.8
2.8
3.3
3.3
2.8
Q187
2SA1576
C196
150P
CH
C197
39P
CH
C198
220P
R203
10K
Q195(C-12)
BUFFER
R231
1K
Q195
2SA1576
(C-12)
(COMPONENT SIDE)
(CONDUCTOR SIDE)
Q195
A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
9
10
11
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27

[HEAD CLEANING]

After an extended period of use the video image may become indistinct or may not appear at all during playback of a tape. The cause of this usually are dirty video heads. For remedy, cleaning of the heads is required.

Check for Head Clogs During Recording

① Use a blank tape, record a short section, then press the stop button to stop.
② Set to recording mode again.
③ If the [✖] mark is flashing in the viewfinder at this time, head clogs are occurred.

Check During Playback of a Tape

① Play back a pre-recorded tape and display the image on a TV screen.
② If there is no sound and the image is unstable, no image appears on the screen, or tape transport is unstable, head clogs are occurred.

Remedy

[Cleaning method using a cleaning tape]

- Use the Cleaning Tape. (Please follow the instructions attached to the cleaning tape.)

SECTION 3
BLOCK DIAGRAMS

3-1. OVERALL BLOCK DIAGRAM

*1 : A/B
A : CCD-FX430/FX435/FX630
B : CCD-FX530
ZOOM LENS
M904 IRIS METER
M905 FOCUS MOTOR
M906 ZOOM MOTOR
HALL
FOCUS SENSOR
ZOOM SENSOR
VC-143/142 BOARD *1
(See Page 4-11, 4-14, 4-17, 4-19)
IC751, IC752, IC755
IRIS DRIVE
HALL AMP
IC754
FOCUS MOTOR DRIVE
ZOOM MOROT DRIVE
IC753
FOCUS/ZOOM PRE DRIVE
(See Page 4-8)
(CCD-FX630)
FP-49 BOARD
YAW SENSOR
PITCH SENSOR
IC772
IC775
STEADY SHOT SENSOR AMP
IC776
A/D COV
IC777
STEADY SHOT CONTROL
CAM SO, CAM SI, CAM SCK
ZM SO, ZM SCK
FP-46 BOARD
(See Page 4-6)
IC691
CCD IMAGER
CCD OUT
V1-V4, V SUB
H1, H2, PG
IC703
SIGNAL SEPARATION AGC
OUT
IC704
A/D CONV
IC705
DEFECT COMPEN-SATION
IC701
V DRIVE
IC702
TIMING GENERATOR
D0-D9
IC609
CAMERA CORE
(DIGITAL CAMERA PROCESS)
CCD-FX430/FX435/FX530
IC604
CHARACTER MIX
CCD-FX630
IC613
ZOOM PROCESS
ZOOM SW
IC602
CAMERA CONTROL
IRIS PWM
HALL OUT
ZM RST
FC RST
ZOOM SW
MAN FOCUS1, 2
IC603
EVR
ADJUST VOLTAGE
IC611
OPTICAL DETECTOR
IC601
EEPROM
IC610
SYNC GENERATOR
IC614
ON SCREEN DISPLAY
VTR SO, VTR SI, VTR SCK
CAM Y
CAM C
VS-110/111 BOARD *1 (See Page 4-25, 4-28, 4-31, 4-34, 4-37)
DATA TO SLAVE, DATA TO MASTER, VTR SCK
LM-40 BOARD
(See Page 4-45)
M903 LOADING MOTOR
LOAD, UN LOAD
LOADING MOTOR DRIVE
IC507 (1/4)
S001 MODE SWITCH
MSW 0-2
S005 C.C. DOWN
CC DOWN
R009 DEW SENSOR
DEW SENS
DEW
IC505
SYSTEM CONTROL / SERVO
SYSTEM CONTROL
SERVO
D001 T/E LED
TAPE TOP SENSOR
Q001
Q002
TAPE END SENSOR
H001 T REEL FG SENSOR
H002 S REEL FG SENSOR
TOP SENS
T REEL (+), (-)
S REEL (+), (-)
T REEL FG AMP
S REEL FG AMP
T REEL FG
S REEL FG
Q503 (1/2)
TAPE TOP DETECT
TAPE END DETECT
END SENS
T/E LED ON
S002
ME/MP
REC PROOF
ME/MP SW
REC PROOF SW
(See Page 4-45)
LS-33 BOARD
D PG, D FG
WAVE SHAPER
DRUM PG, DRUM FG
SL-38 BOARD (1/2)
CLOG, SP/LP DET
VIDEO, AUDIO, SERVO, CONTROL SIG
IC501
EEPROM
IC503
MODE CONTROL (MASTER)
CHIP SELECT
SIRCS SIG
EJECT, START/STOP
K AD IN 0, 1
VTR MODE SW, CAM+STBY MODE SW
AGE, DATE, TIME
K AD 2-4
BUZZER
BACK UP VDD
IC502
BACK UP VDD SWITCH
VTR UNREC
VTR DD ON
CAM DD ON
(See Page 4-49, 4-57)
AU-157/168 BOARD *1 (1/2)
(See Page 4-53, 4-61)
MA-197/198 BOARD *1 (1/2)
REMOTE CONTROL RECEIVER
IC002
CONTROL SWITCH BLOCK (FK)
ZOOM SWITCH
S102, 103
EJECT, START/STOP KEY
S104-106, 109-111, 100
VTR FUNCTION KEY
S101
STANDBY SWITCH
CONTROL SWITCH BLOCK (CK)
S223
POWER SWITCH
MAN FOCUS1, 2
S200-222
DDS KEK
S201-208, 217
CAMERA FUNCTION KEY MENUKEY
F.VR BLOCK
S219
FOCUS MANUAL
(See Page 4-41)
ZB-2 BOARD
BU101 BUZZER
L1101 LITHIUM BATTERY
TERMINAL BOARD
J201
VIDEO
RFU DC OUT
5V
AUDIO
AUDIO L
AUDIO R
(CCD-FX430/FX435/FX630)
(CCD-FX530)
VIDEO I/O
AUDIO I/O L
AUDIO I/O R
IC201, IC203, IC205, IC208
Y PROCESS
C PROCESS
EVF OUT
Y RF
PB RF
PB C RF
REC C RF
IC951
EVR
ADJUST VOLTAGE
(See Page 4-53, 4-61)
MA-197/198 BOARD *1 (1/2)
IC003/001 *1
STEREO MIC AMP
L
R
MIC
J801
EXT MIC
MIC L
MIC R
CCD-FX530
(See Page 4-49, 4-57)
AU-157/168 BOARD *1 (1/2)
IC401/1301 *1
AFM AUDIO PROCESS
HEADPHONE L
HEADPHONE R
REC AFM RF
PB RF
(See Page 4-69)
DD-64/65 BOARD *1 (1/4)
HEADPHONE
EARPHONE
J903
CCD-FX430/FX435/FX630
09
IC102
REC/PB AMP
CH1
CH2
RF SWP
HC HD
FLYING ERASE OSC
FE
FLYING ERASE
MD A-MECHA
IC508
ATF SERVO
PB SP/LP DET
CLOG DET
REC ATF
REF PILOT
ATF ERROR
CLOG, SP/LP DET
M901 DRUM MOTOR
DRUM PG, FG
IC506 (1/2)
DRUM MOTOR DRIVE
DRUM VS
IC901 (1/2)
DRUM PWM DRIVE
CAPSTAN PWM DRIVE
DRUM ERROR
CAP ERROR
LPF
DRUM PWM
CAP PWM
CAP VS
M902 CAPSTAN MOTOR
CAPSTAN FG
CAPSTAN MOTOR DRIVE
WAVE SHAPER
IC001
CFG (+), (-)
DD-64/65 BOARD *1 (1/4)
(See Page 4-69)
CAP FG
RF SWP
IC507 (1/4)
LANC I/O
SL-38 BOARD (1/2)
(See Page 4-45)
LANC SIG
J902
REMOTE
DD-64/65 BOARD *1 (1/4)
(See Page 4-69)
DD-64/65 BOARD * (1/4)
IC901 (1/2)
CAMERA DC/DC CONVERTER
VTR DC/DC CONVERTER
CAM 15V
CAM -8.5V
CAM 5V
D5V
D3.6V
R/P 5V
MT 5V
EVF 5V
AU 5V
VID 5V
SS 3.6V
MOTOR UNREG
VTR UNREG
EVF OUT
MAIN BATTERY
VF-44 BOARD
(See Page 4-64)
T501
H OUT
CRT DRIVE
IC501
V901
DY
H
V
DH1, DH2
HV
G1
CRT

3-2. CAMERA BLOCK DIAGRAM

VC BOARD (See Page 4-11, 4-14, 4-17, 4-19)
(See Page 4-6)
FP-46 BOARD
IC691
CCD IMAGER
CCD OUT
Q691, 692
BUFFER
V1
V2
V3
V4
RG
H2
H1
LH1
VL
SUB
VDD (+15V)
CN701
CAM-8.5V
V SUB CHK
CAM 15V
IC691 ⑧
IC691 ① ②
IC691 ③ ④
IC703
SIGNAL SEPARATION AGC
AGC
CLAMP
AGC CONT 1
AGC CONT 2
XSHP
XSHD
XRS
PBLK
PB
DATA
VCC1
VCC2
VCC3
CAM5V
CCD LEVEL
CLPDB
CLPDM
LINE
AMP
CAM CLAMP
OFFSET
REF TOP
REF BOTTOM
VRT
VRB
IC703 ㉕
IC703 ⑥
IC704
A/D CONVERTER
EVA
STATE
D9 (MSB)
D0 (LSB)
A IN
REFF
REFDF
CLK
D5V
TESTX
CAM ON
IC704 ①
IC701
V DRIVE
V SUB
XV 1
XV 2
XV 3
XV 4
XSG 1
XSG 2
DC GENERATOR
DC IN
DC OUT
V SUB CONT
Q701
DC BIAS
PD CONT
IC702
TIMING GENERATOR
CLPDM
XSHP
XSHD
XRS
PBLK
ID
WEN
DEF
VGAT
MCK
CL
CK
OSC O
OSC I
X701
28.6363MHz
PRIME OSCRATION
AHD
AVD
SSK
SSI
SEN
RST
ZSK
ZSI
ZEN
CAM SCK
CAM SO
CS TG
SYS RST
IC702 ⑫
IC702 ⑤
IC705
DEFECT COMPENSATION
XVV1
XSG1
X DEF
D DEF
PBLK
MCK
IDEF
MRST
TESTX
SRT
DPD RST
TEST X
START
CCD-FX630
IC613
ZOOM PROCESS
CS ZOOM
ZM SCK
ZM SO
SLD
SBCK
SBI
FP
CHB
MME
FL02
AHB
VDAT
IC609
D/A CONVERTER
DIGITAL CAMERA PROCESS
D/A CONV
IDY
IDC
VREF Y
VREF C
CAM SCK
CAM SO
CS CORE
CAM SI
CORE RST
CCD-FX430/435/530
IC609 ⑬ ⑱
IC609 ㊾
IC609 ㊳ ㊼
IC609 ㊻
IC609 ㉗
IC609 ⑳
IC609 ⑮
IC609 ㊻
IC604
CHARACTER MIX
WHITE LEVEL
BLACK LEVEL
BLK2
VC2
Q604
BUFFER
Q605
Y LPF
CHROMA LPF
CN601
CAM Y
CAM C
VIDEO (1) (VS)
FSC
REG H
PB SYNC
DS VDW
DS VCB
EVF VDW
PB V
SYS RESET
DATA TO SLVE
CS OSD
SCK
FLD
CAM VD
NEXT CAM
DATA TO MSTR
CS SS
ZOOM SW
MAN FOCUS 2
MAN FOCUS 1
SYSTEM CONTROL (VS)
IC614
ON SCREEN DISPLAY
OSC IN
H SYNC
V SYNC
VC1
BLK1
VD
VBLK
VC2
VBLK2
PCL
DATA
CS
CLK
(See Page 4-8)
FP-49 BOARD
(CCD-FX630)
SE691
PITCH SENSOR
SE692
YAW SENSOR
W691
CN755
LPF
IC775 (1/2)
IC774 (1/4)
IC773
IC772
AN1
AN2
IC776
A/D CONVERTER
VCC
AVRH
AVRH
HSTX
CI
SO
CLK
TCLKX
CSX
CLK
IC776 ⑩
IC777
STEADY SHOT CONTROL
ADC STBY
VST SO
VST SI
VST SCK
CS ADC
CS ZOOM
CS ZTG
EXTAL
XTAL
C RESET
X775 12MHz
CDV
FLD
CAM SCK
S OUT
S IN
CS V NICON
V RST
FLD1
IC777 ㊵
ZOOM LENS UNIT
M904 IRIS METER
DRIVE (+)
DRIVE (-)
CONT (+)
CONT (-)
BIAS (+)
HALL (+)
HALL (-)
BIAS (-)
CN751
SENSE VCC
ZOOM SENSER
ZM RST
RST LED
FOCUS SENSER
FC RST
SN/CA
LENS TYPE
Q751
Q752
M906 ZOOM MOTOR
M905 FOCUS MOTOR
ZM A
ZM B
FC A
FC B
IC751 (1/2)
IRIS DRIVE
IC752 (1/3)
IRIS DRIVE
IC755
IRIS PWM
HALL A/D
IC752 (1/3)
HALL BIAS CONTROL
IC751 (1/2)
HALL AMP
IC752 (1/3)
HALL GAIN CONTROL
HALL GAIN
HALL OFSET
REF 2V
IC603
D/A CONVERTER (EVR)
ADC CONT 1
ADC CONT 2
V SUB CONT
PO CONT
V REF Y
V REF C
H GAIN
H OFS
REF 2V
A/D REF
DA STB
CS CAM D/A
CAM SCK
CAM SO
IC753 ②
IC753 ⑧
IC602 ㊹
IC754
ZOOM MOTOR DRIVE
FOCUS MOTOR DRIVE
VM1
VM2
VM3
VC
IC753
ZOOM/FOCUS PRE DRIVE
CK IN
PAL
CLEAR
S OUT
S IN
SCK
CS
HD IN
VD IN
VDD
NTSC
PDR RST
AHD
PBV
IC602
CAMERA CONTROL
WEN
TEST X
START
CAM ON
IRIS PWM
HALL A/D
DA STB
CS TG
CS CORE
CAM SCK
CAM SO
CAM SI
X601 2MHz
EXTAL
VST/CORE RST
CS CAM DPD
CS AF DPD
NTSC
NRML/VST
DPD RST
LENS RST LED
FC RST
ZM RST
LENS TYPE
CS VST
RESET
CS EEP ROM
EEP ROM RESET
EEP ROM BUSY
VTR SO
VTR SCK
CAM CS
PB V
VTR SI
ZOOM SW
MAN FOCUS (2)
MAN FOCUS (1)
CS PDR
PDR RST
IC611
OPTICAL DETECTOR
NT/PAL
ZOOM
DPD RESET
CS AF DPD
AF SI
AF SO
AF SCK
CS CAM DPD
NORMAL/VST
CCD-FX430
CCD-FX430/435/530
DPD ID
IC601
EEP ROM
RES
BUSY
IC753 ①
IC609 ㊻
IC610
SYNC GENERATOR
C SYNC
C BLK
BF
LALT
W KEY
REG H
SLAVE COUNTER
MASTER COUNTER
AFC
PLL
LPF
SERIAL LATCH
VTR SCK
VTR SI
CS SS
SYS RESET
AVD1
FLD
PB V
CD V
IC609 ⑳
IC609 ⑲
IC610 ㊴
IC610 ⑭
09

3-3. VIDEO (1) BLOCK DIAGRAM

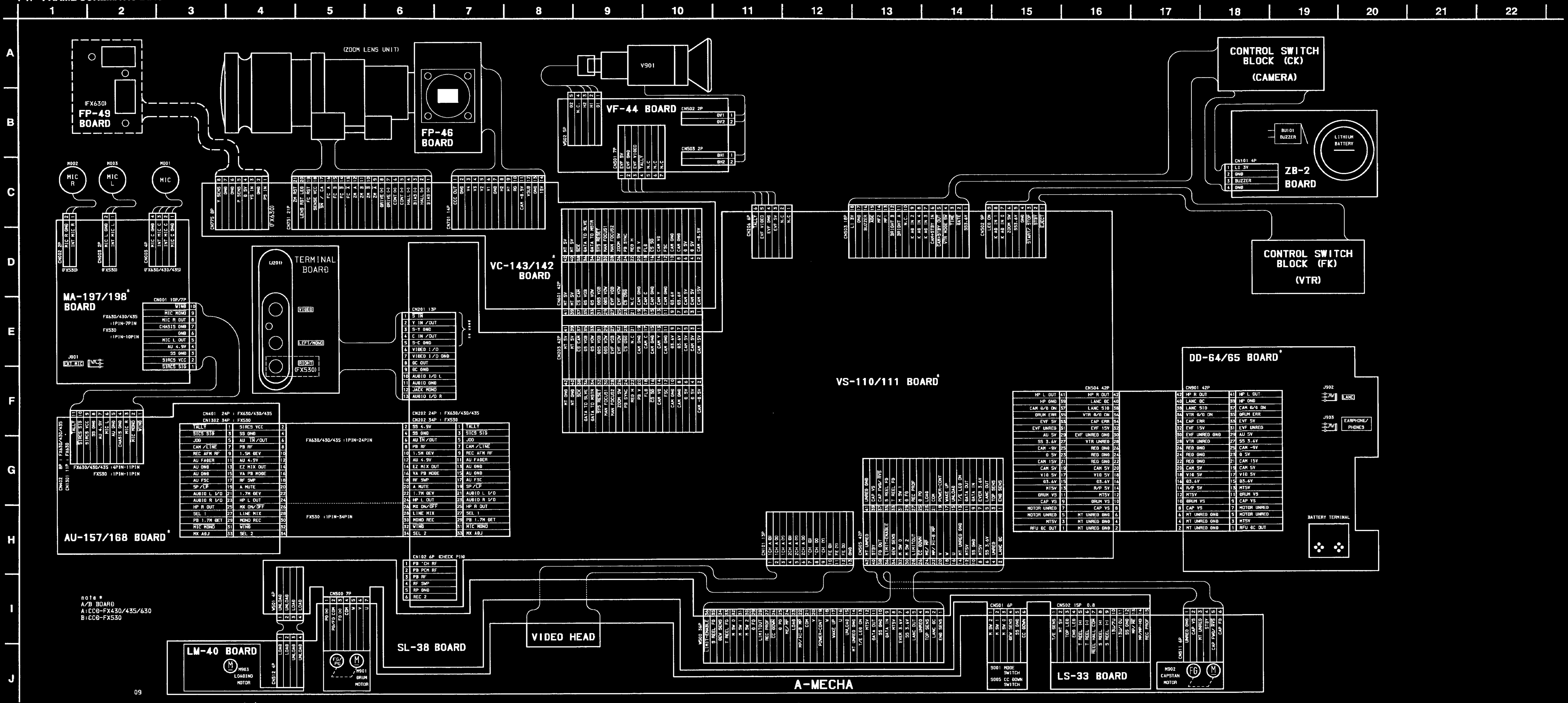
IC201 Y/CHROMA PROCESS
BOP
Q254
REC Y RF
SOFT LIM OUT (Q117)
VIDEO (2)
CARR CONT
DEV CONT
SMEAR CONT
WBC
8.0 PULSE
REC Y
PB Y
FM MOD/DEMOD
CLIP ADJ
EMPH/DEEMPH
IC205 (1/2)
FILTER
VCA
PB Y LEVEL ADJ
HPF
IC201 41 PB
IC201 39 REC
IC201 10 PB
IC201 7 PB
YNR
EQ. TRAP
COMB
YD (1H DELAY Y)
YD ADJ
1H/2H DELAY Y, C
COMB ADJ
IC203
1H DELAY
Q235, FL201, Q237
FILTER
RV202
Y/C SEP
Q260
BUFFER
FSC (IC201 43)
(LINE+PB) 5V (Q226)
Q258, 259
CHROMA ATT
PB C RF (Q114)
REC C RF
PB C
REC C
IREF
VREG
FILTER
ACC
CARR CONV
CNR
IC201 23 REC
IC201 23 PB
IC201 40 PB
IC201 8 REC
CARR CONV
APC VCO
VXO
ACK ID
X201 3.58MHz
IC201 REC/PB
AGC
DDS
NR
MIX
EXT Y
LINE Y
PB/EE Y
REC
Y COMB OUT (REC/PB)
VIDEO 4.9V
VIDEO OUT
SYNC
EXT C
PB/EE C
BURST/C EMPH/DEEMPH
IC201 5 REC
IC201 5 PB
IC201 32 REC
IC201 32 PB
IC201 36 PB
IC201 24 REC/PB
IC205
AMP
IC208
LOGIC
Y MUTE
DS VOB
Q232, 234, 238, 242, 247, 264
FILTER
Q265
Q224
VCC
VGI
BUS DECODER
CK
SI
CS
VTR SCK
DATA TO SLVE
VIDEO CS
SWP
VI SWP (SERVO IC508 28)
IC201 15 REC/PB
3.58MHz
TERMINAL BOARD
CN201
J201
VIDEO
Q956
BUFFER
Q958, 959, 960
MIX FILTER
CN206
EVF Y
EVF (VF-44)
CN203
FSC
CAM Y
CAM C
REC H
SYNC
EVF VOW
DS VOW
DS VOB
CAMERA (VC)
SYNC (IC201 24)
D204
Q253, Q201
LOGIC
Q255
LEVEL SHIFT
* SP/LP
*IN/OUT
COMP REC (IC505 25)
SP/LP (IC505 71)
V MUTE (IC505 47)
JOG (IC505 4)
VA PB MODE (IC505 95)
JOG VD (IC505 5)
V IN/OUT (IC505 93)
SYSTEM CONTROL
IC201 14 REC
IC201 14 PB
Q225, 226
LOGIC
COMP REC (SYSCON IC505 25)
VA PB MODE (SYSCON IC505 95)
IC951 CONVERTER
CS
DATA TO SYAE
SCK
CS DA
SYSTEM CONTROL
SWP
VI SYNC
SERVO
SYNC
FCS (IC201 43)
Q219
BUFFER
1.5M DEV
AUDIO FADER
AU FSC
IR ADJ
MX ADJ
1.7M DEV
(CCD-FX530)
AUDIO (AL)
CN202
VIDEO (2)

VS BOARD (See Page 4-25, 4-28, 4-31, 4-34, 4-37)

SECTION 4

PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
A
B
C
D
E
F
G
H
I
J
(FX630)
FP-49 BOARD
(ZOOM LENS UNIT)
FP-46 BOARD
V901
VF-44 BOARD
CONTROL SWITCH BLOCK (CK) (CAMERA)
BU101 BUZZER
LITHIUM BATTERY
ZB-2 BOARD
M002 MIC R
M003 MIC L
M001 MIC
MA-197/198* BOARD
J801 EXT MIC
(J201)
TERMINAL BOARD
VIDEO
LEFT/MONO
RIGHT (FX530)
VC-143/142* BOARD
CONTROL SWITCH BLOCK (FK) (VTR)
DD-64/65 BOARD*
J902 LANC
J903 EARPHONE/PHONES
VS-110/111 BOARD*
BATTERY TERMINAL
FX630/430/435 :1PIN-24PIN
FX530 :1PIN-34PIN
AU-157/168 BOARD*
note *
A/B BOARD
A:CCD-FX430/435/630
B:CCD-FX530
LM-40 BOARD
M903 LOADING MOTOR
SL-38 BOARD
M901 DRUM MOTOR
VIDEO HEAD
S001 MODE SWITCH
S005 CC DOWN SWITCH
LS-33 BOARD
M902 CAPSTAN MOTOR
A-MECHA
09

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this , the necessary note is printed in each block.)

- **For printed wiring boards.**
- ▨ : Pattern from the side which enables seeing.
  (The other layers'patterns are not indicated.)
- Circled numbers refer to waveforms.
- (B) or (F), etc. of capacitors indicate the temperature characteristics.
- ○: Through hole.

* Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

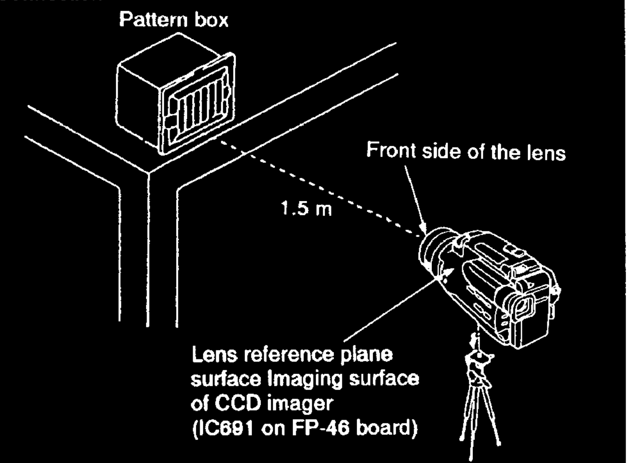
- **For schematic diagrams.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minuts side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4W unless otherwise noted.
  Chip resistor are 1/10W unless otherwise noted.
  kΩ : 1000Ω , MΩ : 1000kΩ .
- All capacitors are in μF unless otherwise noted. pF: μμF.
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ⊡ : nonflammable resistor.
- ⊡ : fusible resistor.
- ☐ : panel designation.
- △ : internal component.
- [illegible] adjustment for repair.
- [illegible]
- [illegible]
- [illegible]
- [illegible] numbers refer to waveforms.

Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safty. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

- **Measuring conditions voltage value and waveform.**
(CAMERA block)
- The object is color bar chart of pattern box.
- Voltages are dc between ground and measurement points.
  Readings are taken with a digital multimeter (DC 10MΩ).
- Voltage variations may be noted due to normal production tolerances.

1. Connection


Pattern box
Front side of the lens
1.5 m
Lens reference plane surface Imaging surface of CCD imager (IC691 on FP-46 board)

2. Adjust the distance so that the output waveform of Fig. a and the Fig. b can be obtain.

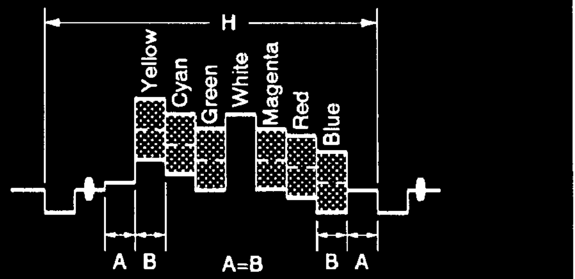

H
Yellow
Cyan
Green
White
Magenta
Red
Blue
A B
A=B
B A

Fig. a (Video output terminal output waveform)

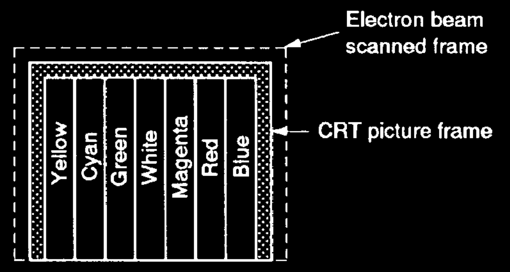

Electron beam scanned frame
CRT picture frame
Yellow
Cyan
Green
White
Magenta
Red
Blue

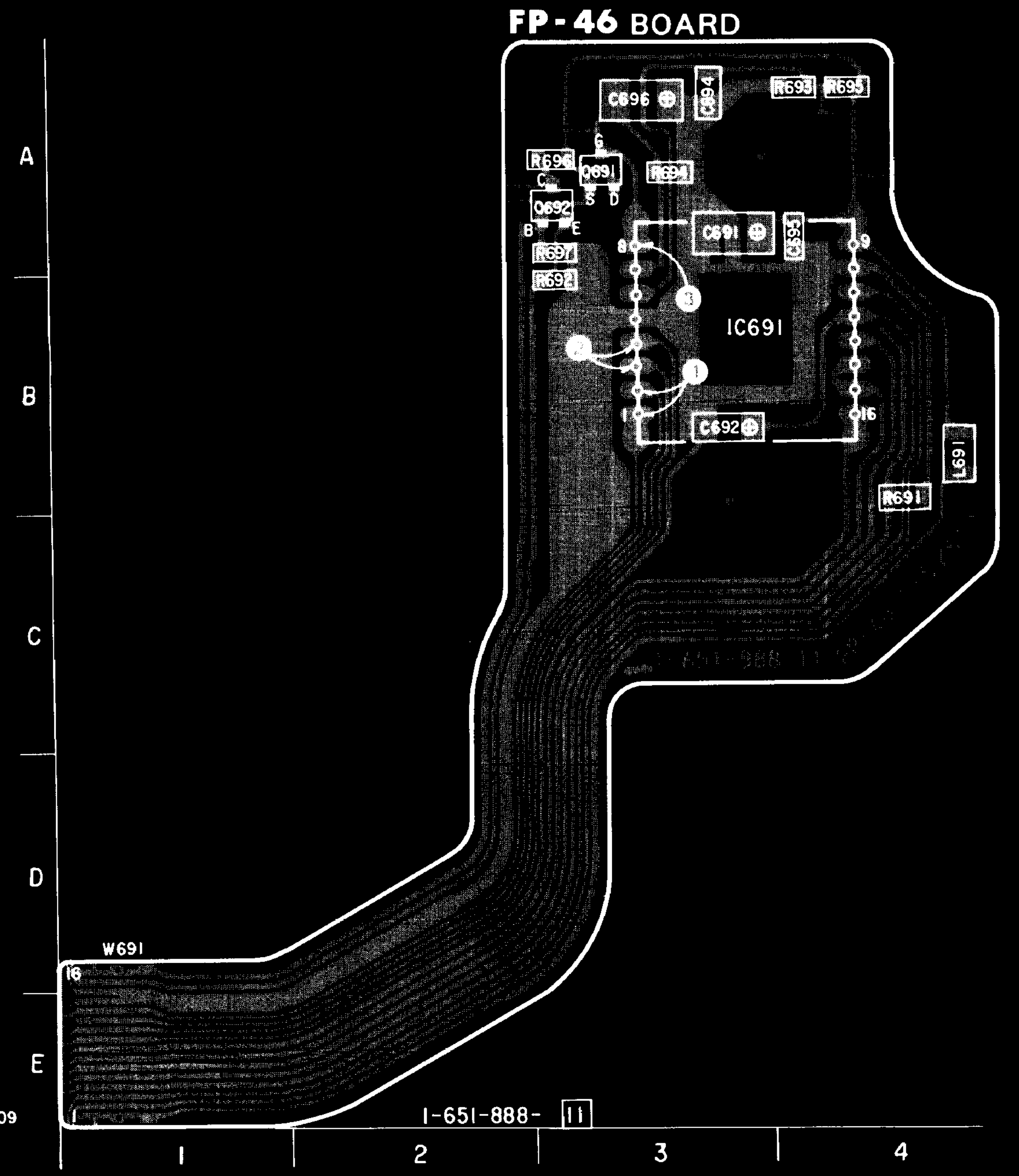
Fig. b (Picture on monitor TV)

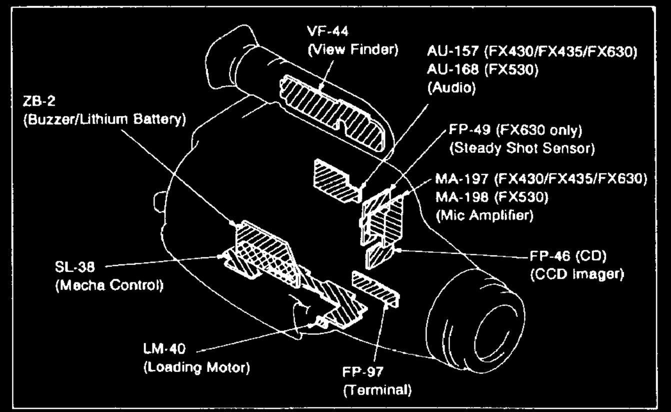
(VIDEO, SERVO/SYSTEM CONTROL, AUDIO, LCD CONTROL)

- Voltages are dc between ground and measurement points.
- Readings are taken with a color-bar signal input.
- Readings are taken with a digital multimeter (DC 10MΩ).
- Voltage variations may be noted due to normal production tolerances.

FP-46 (CCD IMAGER) PRINTED WIRING BOARD

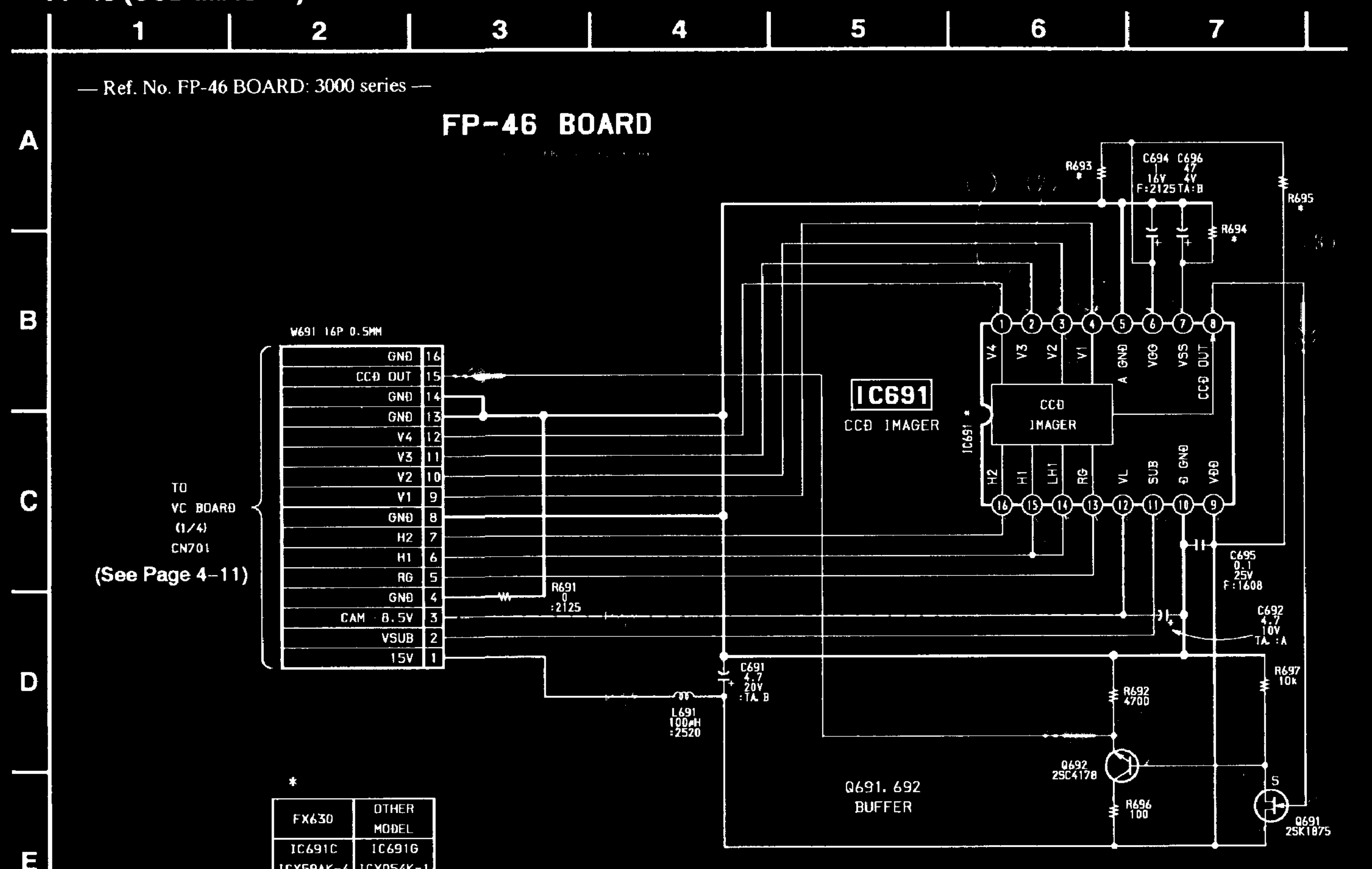
— Ref. No. FP-46 BOARD: 3000 series —


FP-46 BOARD
A
B
C
D
E
1
2
3
4
C696
C694
R693
R695
R696
Q691
R694
Q692
R697
R692
C693
IC691
C692
R691
L691
W691
16
1-651-888- 11
09


VF-44 (View Finder)
AU-157 (FX430/FX435/FX630)
AU-168 (FX530)
(Audio)
ZB-2 (Buzzer/Lithium Battery)
FP-49 (FX630 only) (Steady Shot Sensor)
MA-197 (FX430/FX435/FX630)
MA-198 (FX530)
(Mic Amplifier)
FP-46 (CD) (CCD Imager)
SL-38 (Mecha Control)
LM-40 (Loading Motor)
FP-97 (Terminal)

FP-46 (CCD IMAGER) SCHEMATIC DIAGRAM

— Ref. No. FP-46 BOARD: 3000 series —


1
2
3
4
5
6
7
A
B
C
D
E
FP-46 BOARD
W691 16P 0.5MM
GND 16
CCD OUT 15
GND 14
GND 13
V4 12
V3 11
V2 10
V1 9
GND 8
H2 7
H1 6
RG 5
GND 4
CAM 8.5V 3
VSUB 2
15V 1
TO VC BOARD (1/4) CN701
(See Page 4-11)
R691 0 :2125
C691 4.7 20V :TA B
L691 100μH :2520
IC691 CCD IMAGER
V4 V3 V2 V1 A GND VGG VSS CCD OUT
H2 H1 LH1 RG VL SUB Φ GND VDD
R693 *
C694 1 16V F:2125
C696 47 4V TA:B
R694 *
R695 *
C695 0.1 25V F:1608
C692 4.7 10V TA :A
R697 10k
R692 4700
R696 100
Q692 2SC4178
Q691 2SK1875
Q691, 692 BUFFER

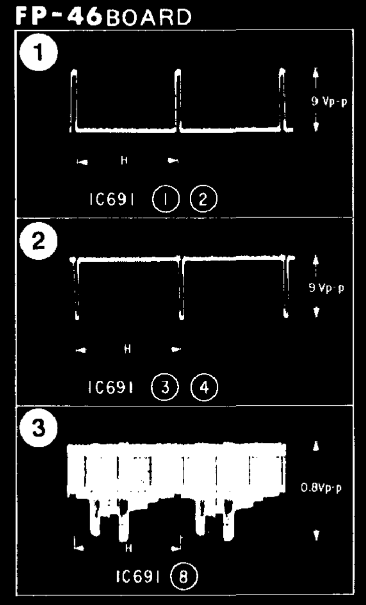
*

FX630	OTHER MODEL
IC691C ICX59AK-4	IC691G ICX054K-1
R693C 39k	R693G 33k
R694C 820	R694G 680
R695C 100k	R695G 220k

- **SIGNAL PATH**

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC			
PB			

FP-46 BOARD

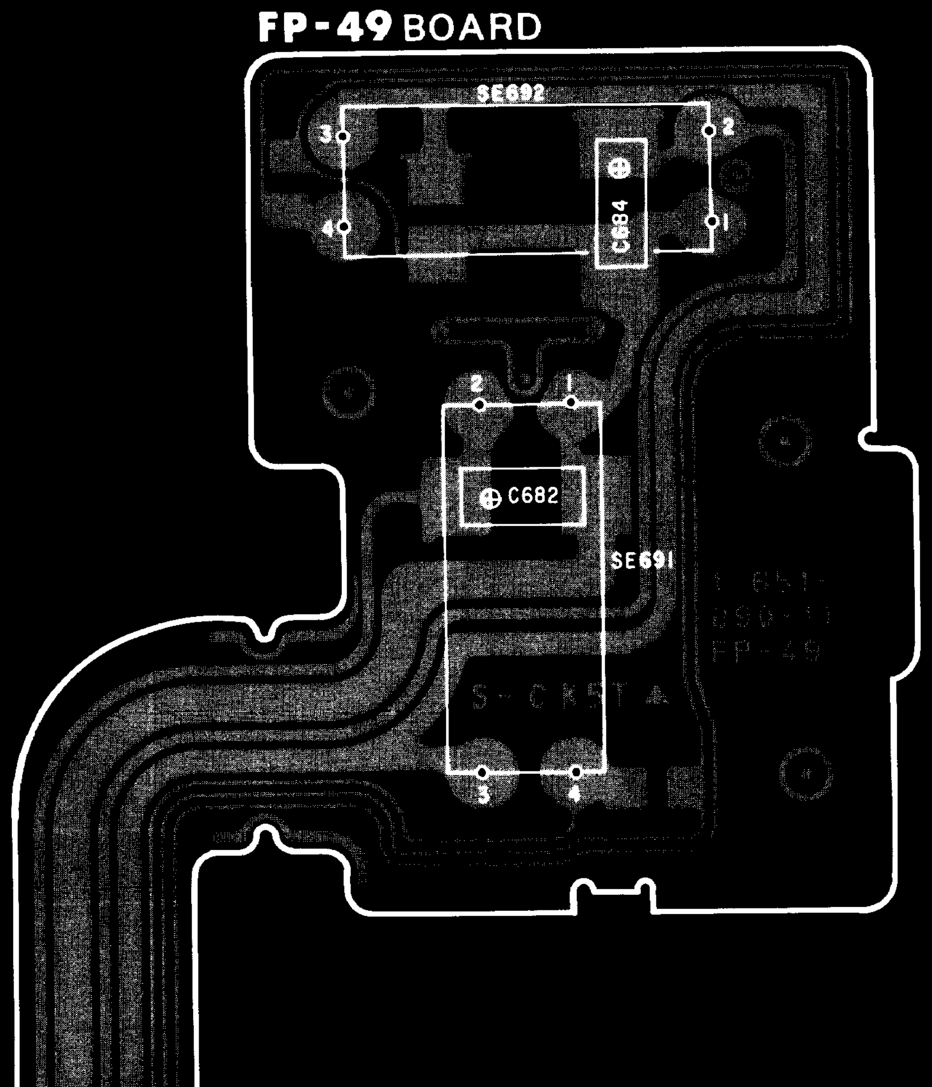


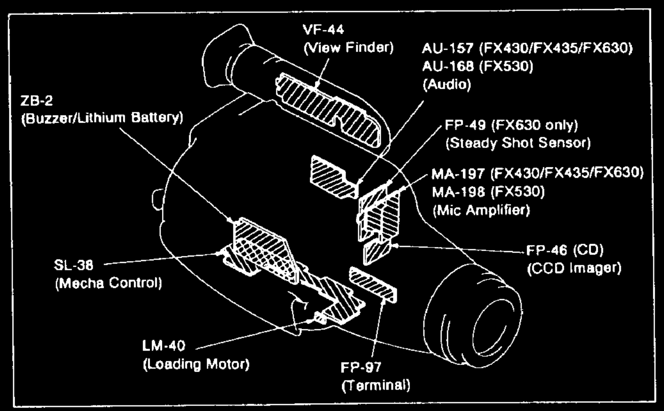
Note on the CCD imager replacement

- Some of this units require the correction data by the CCD imager (IC691 on FP-46 board), some do not.
  The correction data is input in F page and addresses 1D to 2C of the camera micro processor (IC602 on VC board), and also written on the CCD data label put on the shield case (upper) of the DD board.
  The correction data is not required for the CCD imager supplied for repair. Therefore, when replacing the CCD imager to which the CCD data label is put, remove the CCD data label and input 00 to F page and addresses 1D to 2C of the camera micro processor. Refer to the camera adjustment for input method.
- The CCD imager is not mounted for the already mounted FP-46 board supplied as the repair parts.
  When replacing the FP-46 board, remove the CCD imager from the old board and install on the new board.
- Perform all adjustments of the camera block when the CCD imager has been replaced.
- Handle the CCD imager with attention such as MOS IC as it may be broken by static electricity in the structure.
  Also, prevent the receiving light section from dust attached and strong light.

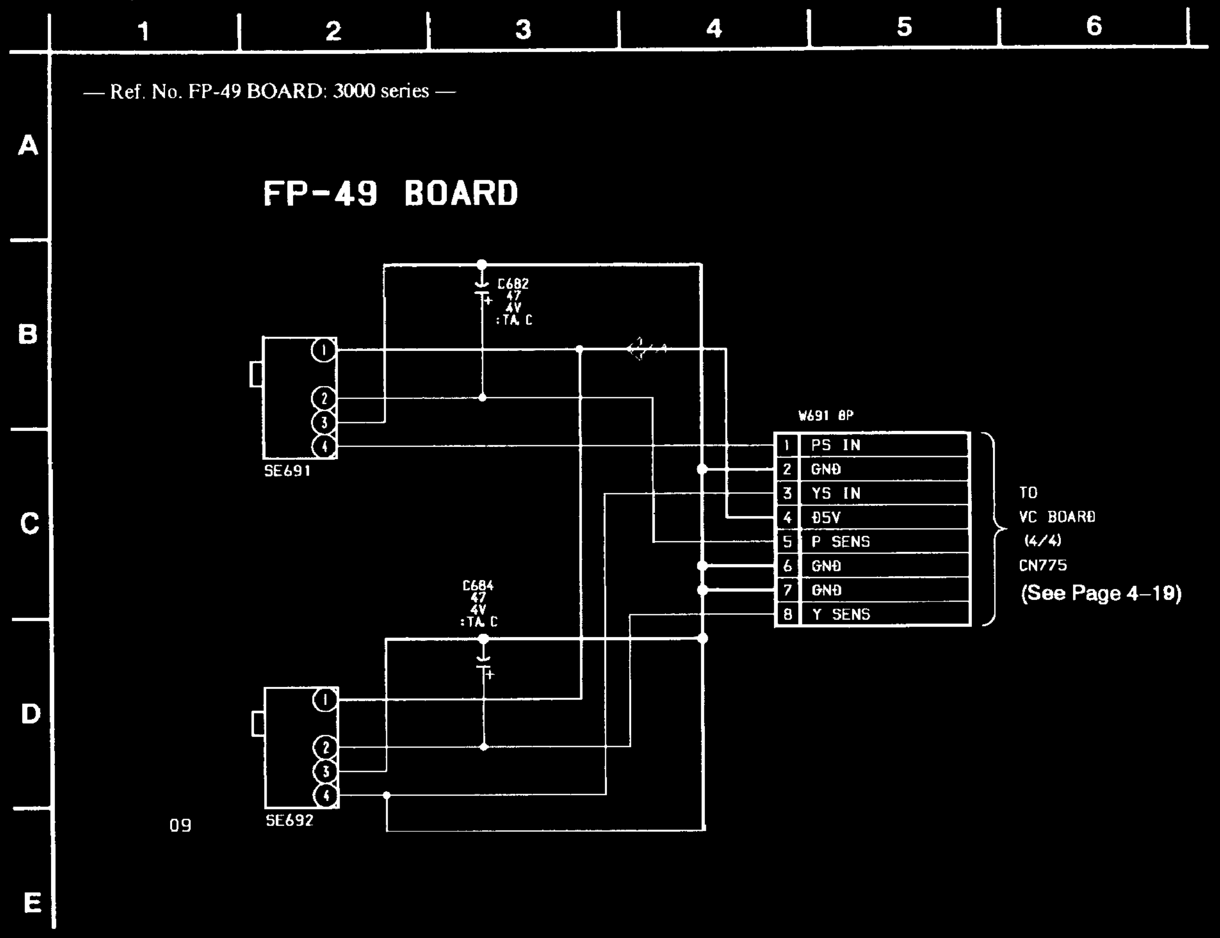
FP-49 (STEADY SHOT SENSOR) PRINTED WIRING BOARD (CCD-FX630)

— Ref. No. FP-49 BOARD: 3000 series —


FP-49 BOARD
SE692
3
2
4
1
C684
2
1
C682
SE691
3
4
W691
09
1-651-890- 11


VF-44
(View Finder)
AU-157 (FX430/FX435/FX630)
AU-168 (FX530)
(Audio)
ZB-2
(Buzzer/Lithium Battery)
FP-49 (FX630 only)
(Steady Shot Sensor)
MA-197 (FX430/FX435/FX630)
MA-198 (FX530)
(Mic Amplifier)
FP-46 (CD)
(CCD Imager)
SL-38
(Mecha Control)
LM-40
(Loading Motor)
FP-97
(Terminal)

FP-49 (STEADY SHOT SENSOR) SCHEMATIC DIAGRAM (CCD-FX630)



— Ref. No. FP-49 BOARD: 3000 series —

1
2
3
4
5
6
A
B
C
D
E
FP-49 BOARD
C682
47
4V
:TA C
SE691
C684
47
4V
:TA C
SE692
W691 8P
1 PS IN
2 GND
3 YS IN
4 Ð5V
5 P SENS
6 GND
7 GND
8 Y SENS
TO
VC BOARD
(4/4)
CN775
(See Page 4-19)
09

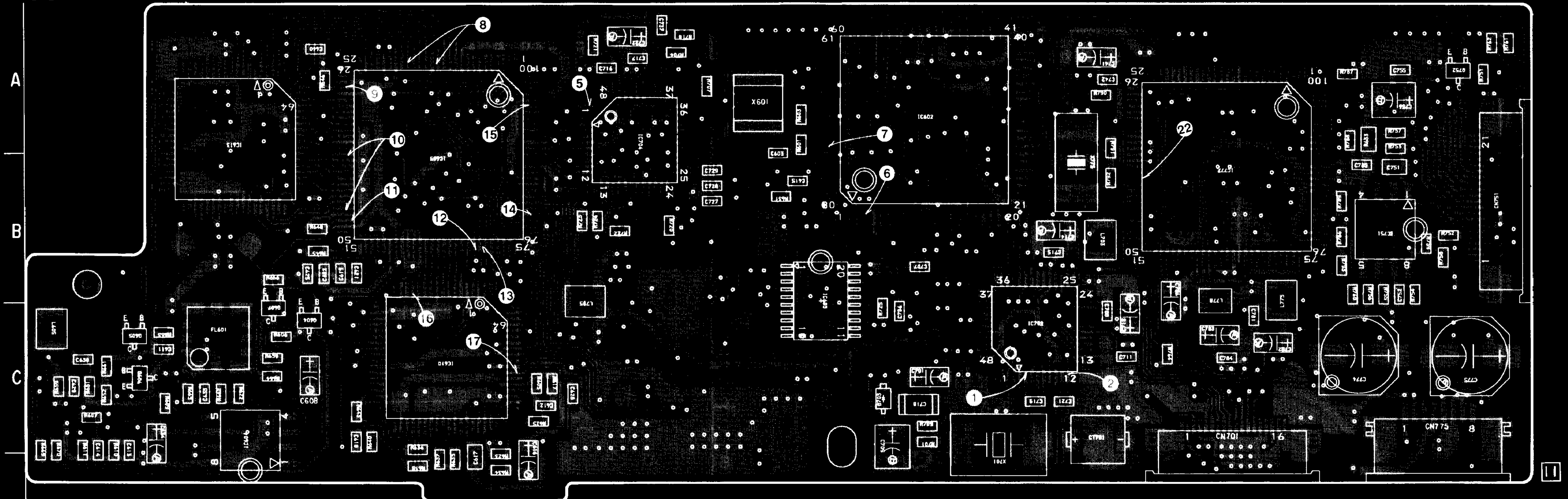
VC (CAMERA, LENS DRIVE, STEADY SHOT CONTROL) PRINTED WIRING BOARD

— Ref. No. VC BOARD: 1000 series —

- **For printed wiring boards.**
- VC board is a four-layer print board. However, the patterns of layers 2 to 3 have not been included in the diagram.

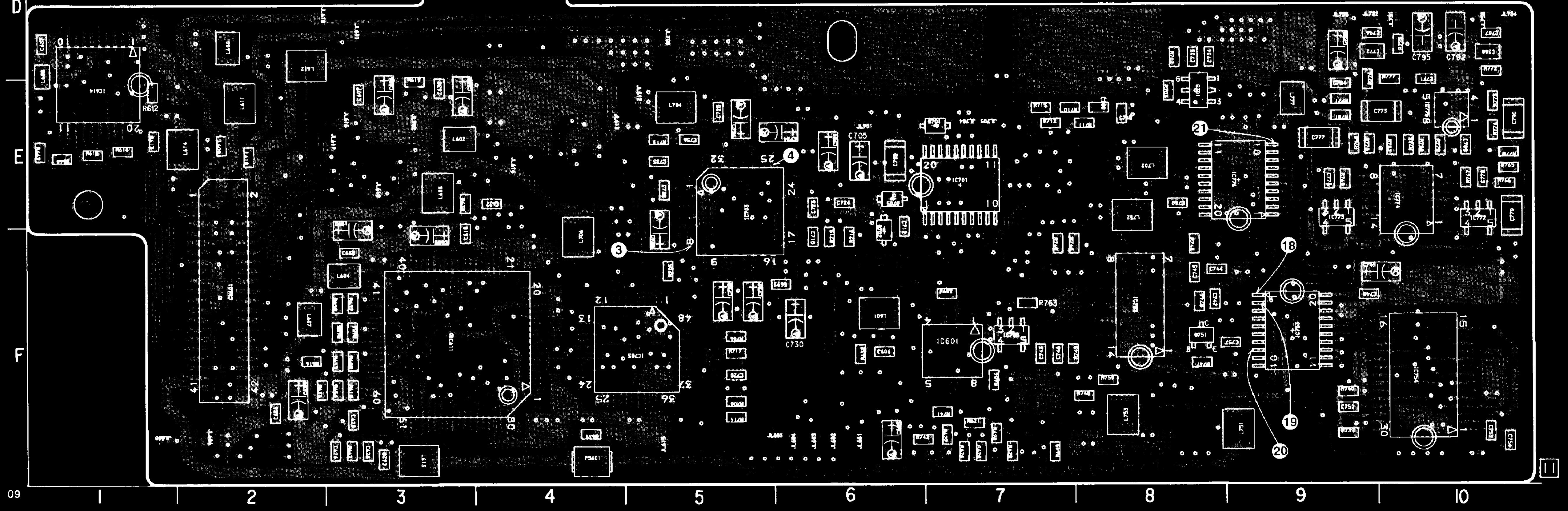
FX430/FX435/FX630	VC-143	1-652-090-11
FX530	VC-142	1-651-942-11

VC BOARD (COMPONENT SIDE)



A
B
C
D
IC613
IC602
X601
IC704
IC772
IC751
IC703
IC702
FL601
C608
X701
CN701
CN775
C774
C775
① ② ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯ ⑰ ㉒

VC BOARD (CONDUCTOR SIDE)



D
E
F
09
1
2
3
4
5
6
7
8
9
10
IC614
R612
IC611
IC701
IC601
C705
C730
C795
C792
R763
PS601
③ ④ ⑱ ⑲ ⑳ ㉑

Before You Begin

Checking Your Model Number

The instructions in this manual are for the four models listed below. Before you start reading this manual and operating the unit, check your model number by looking at the bottom of your camcorder. The CCD-FX430 is the model used for illustration purposes. Otherwise, the model name is indicated in the illustrations. Any differences in operation are clearly indicated in the text, for example, "CCD-FX630 only".
As you read through this manual, buttons and settings on the camcorder are shown in capital letters. e.g., "Set the POWER switch to CAMERA."

Types of differences

Model number	Audio		Steady Shot	Manual Focus	Fader
	Monaural	Stereo			
CCD-FX430	●				
CCD-FX435	●				●
CCD-FX530		●			●
CCD-FX630	●		●	●	●

Note on TV Color Systems

TV color systems differ from country to country. To view your recordings on a TV, you need an NTSC system-based TV. When you want to use a PAL-M system-based TV, you will need an NTSC/PAL-M transcoder (as this is an NTSC system based camcorder). Please check the list on page 43 to find out the TV color system used in your country.

Note on the Supplied RFU Adaptor

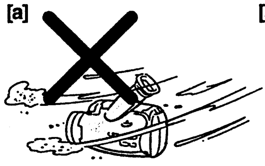
Since each country has its own electricity and TV color system, you may not be able to use the RFU adaptor when you use the camcorder abroad.

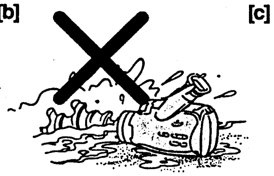
Precaution on Copyright

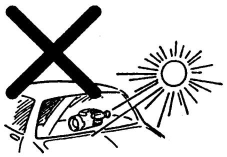
Television programs, films, video tapes, and other materials may be copyrighted. Unauthorized recording of such materials may be contrary to the provision of the copyright laws.

Precautions on Camcorder Care

- **Do not let sand get into the camcorder. When you use the camcorder on a sandy beach or dusty place, protect it from the sand or dust. Sand or dust may cause the unit to malfunction and sometimes the malfunction cannot be repaired. [a]**
- **Do not let the camcorder get wet. Keep the camcorder away from rain and sea water. Letting the camcorder get wet may cause the unit to malfunction and sometimes the malfunction cannot be repaired. [b]**
- **Never leave the camcorder exposed to temperatures above 140°F (60°C), such as in a car parked in the sun or under direct sunlight. [c]**

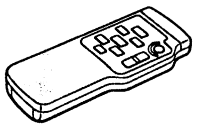
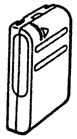
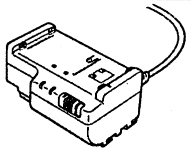
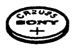
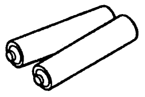
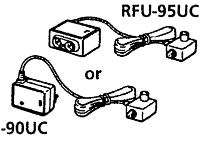
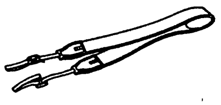
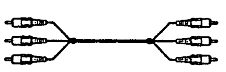
[a]


[b]


[c]


Checking Supplied Accessories

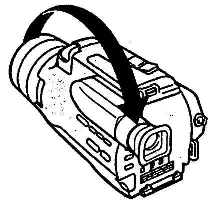
Check that the following accessories are supplied with your camcorder.

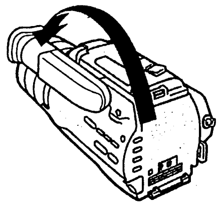
1 	2 	3 
4 	5 	6 
7 	8  (CCD-FX530)	

1. **Wireless Remote Commander** (1) (p. 53)
2. **NP-55 Battery pack** (1) (p. 6)
3. **AC-V25/V25A/V25B AC power adaptor** (1) (p. 6, 20)
4. **CR2025 Lithium Battery** (1) (p. 34)
   (The lithium battery is already installed in your camcorder.)
5. **Size AA (R6) battery for Remote Commander** (2) (p. 53)
6. **RFU-90UC/95UC RFU adaptor** (1) (p. 16)
7. **Shoulder strap** (1) (p. 51)
8. **A/V connecting cable** (**CCD-FX530** only) (1) (p. 16)

After Taking the Camcorder out of the Box

Turn the viewfinder barrel in the direction of the arrow **[a]**. When storing your camcorder, turn the viewfinder barrel in the direction of the arrow **[b]**.

[a]


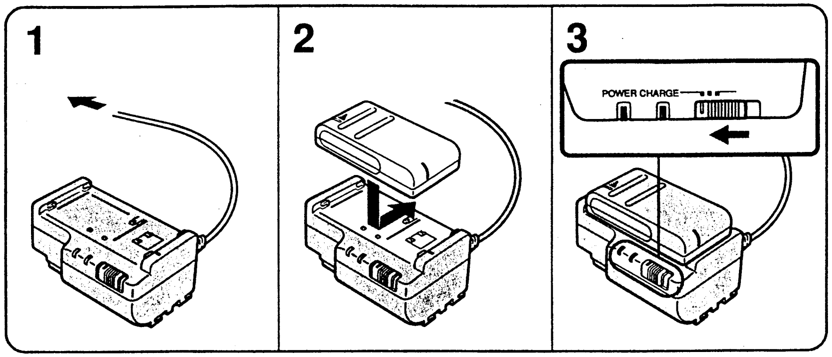
[b]


Charging and Installing the Battery Pack

Before using your camcorder, you first need to charge and install the battery pack. To charge the battery pack, use the supplied AC-V25/V25A/V25B AC power adaptor.

Charging the Battery Pack

Charge the battery pack on a flat surface without vibration.
(1) Connect the power cord to a wall outlet. **(2)** Align the right side of the battery pack with the line on the AC power adaptor, then slide the battery pack in the direction of the arrow. **(3)** Set the selector to CHARGE. The CHARGE lamp (orange) lights up. Charging begins.
When charging is completed, the CHARGE lamp goes out. Set the selector to the center position and unplug the unit from the wall outlet. Then remove the battery pack and install it on the camcorder.
To stop charging, set the selector to the center position.



Charging Time

Battery pack	NP-55 (supplied)	NP-80 NP-80D	NP-77H	NP-66H	NP-60D	NP-55H
Charging time*	70	180	160	120	90	80

* Approximate minutes to charge an empty battery pack using the AC-V25/V25A/V25B (Lower temperatures require a longer charging time.)

Battery Life

CCD-FX430/FX435/FX530

Battery pack	NP-55 (supplied)	NP-80 NP-80D	NP-77H	NP-66H	NP-60D	NP-55H
Typical recording time**	35	95	85	65	45	40
Continuous recording time***	65	180	160	120	85	75

CCD-FX630

Battery pack	NP-55 (supplied)	NP-80 NP-80D	NP-77H	NP-66H	NP-60D	NP-55H
Typical recording time**	30	85	75	55	40	35
Continuous recording time***	55	165	145	105	75	65

** Approximate minutes when recording while you repeat recording start/stop or zooming and turning the power on/off. The actual battery life may be shorter.
*** Approximate continuous recording time indoors.

Important!

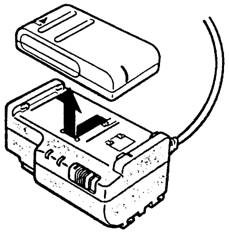
Use the battery completely before re-charging!

Before you recharge the battery pack, make sure the battery has been used up (discharged) completely. Repeated charging while some capacity remains causes a lowering of battery capacity. However, the original battery capacity can be recovered if you use the battery completely and charge it fully again.

To use up the battery, remove the cassette and slide the POWER switch to CAMERA with the battery pack attached, and leave the camcorder until the ▭ indicator flashes and the red lamp flashes rapidly in the viewfinder.

Removing the Battery Pack

Slide the battery pack in the direction of the arrow (see drawing).

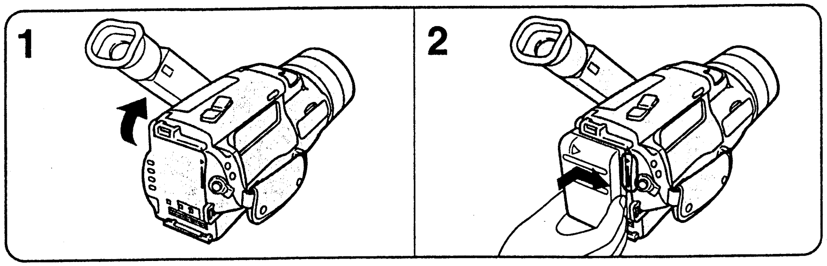


Note on charging the battery pack
- The POWER lamp will remain lit for a while even if the battery pack is removed and the power cord is unplugged after charging the battery pack. This is normal.
- If the POWER lamp does not light, set the selector to the center position and disconnect the power cord. After about one minute, reconnect the power cord and set the selector to CHARGE again.
- You cannot operate the camcorder using the AC power adaptor while charging the battery pack.

Charging and Installing the Battery Pack

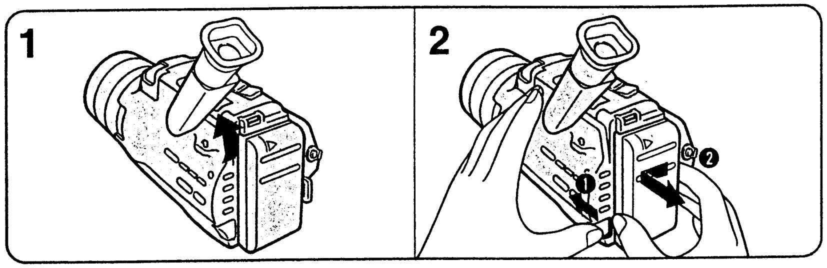
Installing the Battery Pack

(1) Lift up the viewfinder. **(2)** Align the right side of the battery pack with the white line on the camcorder, and slide the battery pack to the right.



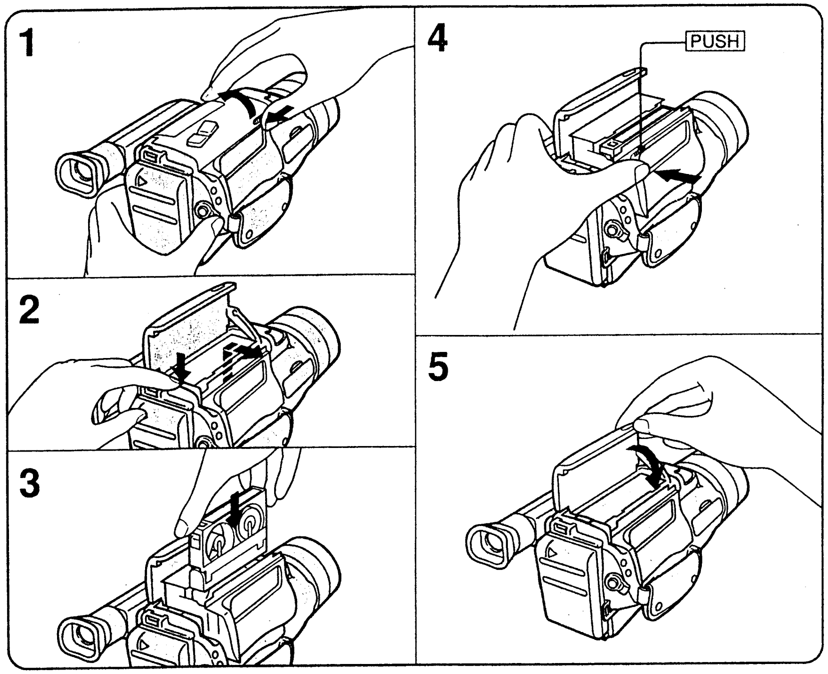
Removing the Battery Pack

(1) Lift up the viewfinder. **(2)** While pressing BATT, slide the battery pack to the left.



Inserting a Cassette

Make sure that the power source is installed.
(1) While sliding the lid lock in the direction of the arrow, lift up the lid. **(2)** Press EJECT. The cassette compartment automatically lifts up and opens. **(3)** Insert a cassette with the window facing out.
(4) Close the cassette compartment by pressing the "PUSH" mark on the cassette compartment.
(5) Close the lid.

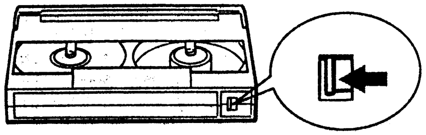


To Eject the Cassette

While sliding the lid lock in the direction of the arrow, lift up the lid of the cassette holder and press EJECT.

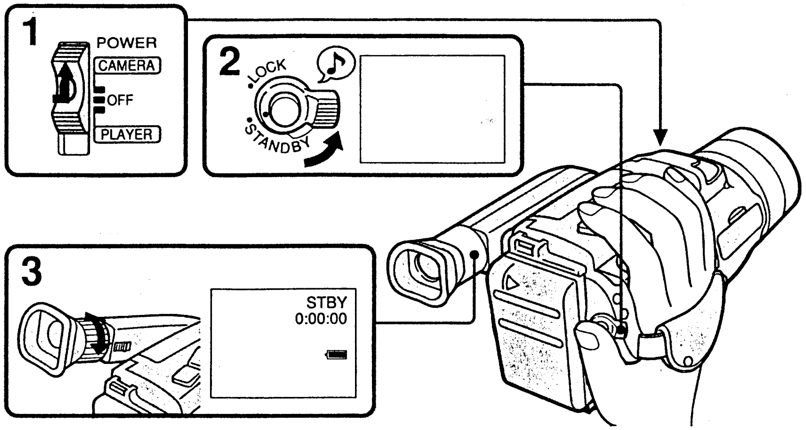
Preventing Accidental Erasure

To prevent accidental erasure, slide the tab on the cassette to expose the red mark. If you try to record with the red mark exposed, the 📼 and ⏏ indicators flash in the viewfinder, and you cannot record.
To re-record on this tape, slide the tab back out covering the red mark.



Adjusting the Viewfinder Lens

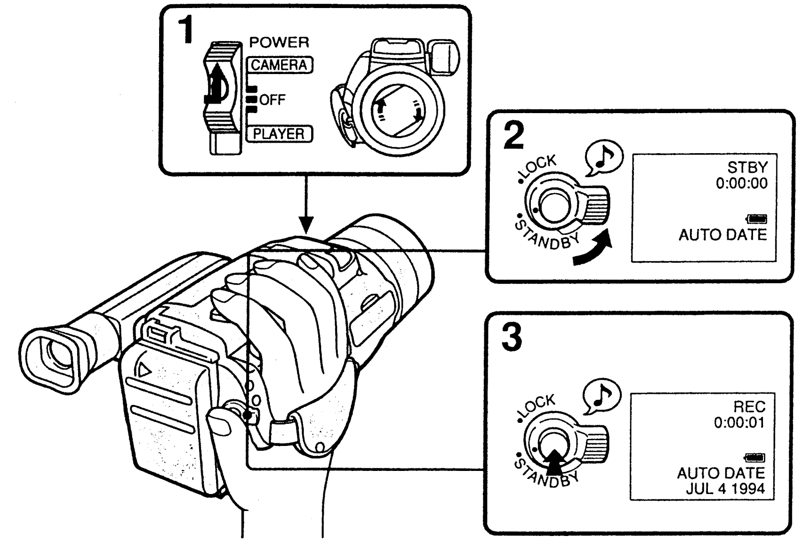
Before you use the camcorder for the first time or after someone else has used it, focus the viewfinder lens. Make sure that the power source is attached to the camcorder.
(1) While pressing the small green button on the POWER switch, slide it to CAMERA. The lens cover opens. **(2)** Turn STANDBY up. **(3)** Turn the viewfinder lens adjustment ring so that the indicators in the viewfinder come into sharp focus.


1
POWER
CAMERA
OFF
PLAYER
2
LOCK
STANDBY
3
STBY
0:00:00

Basic Operations

Camera Recording

Make sure that the power source is installed and a cassette is inserted. The date is automatically recorded for 10 seconds after you start recording (AUTO DATE feature). This feature works only once a day. You can hear the BEEP sound to confirm your operation.
Before you record one-time events, you may want to make a trial recording to make sure that the camcorder is working correctly.
(1) While pressing the small green button on the POWER switch, slide it to CAMERA. **(2)** Turn STANDBY up. **(3)** Press START/STOP. The camcorder starts recording. The "REC" indicator appears and the red lamp lights up in the viewfinder. The camera recording/battery lamp on the viewfinder barrel also lights up.


1
POWER
CAMERA
OFF
PLAYER
2
LOCK
STANDBY
STBY
0:00:00
AUTO DATE
3
LOCK
STANDBY
REC
0:00:01
AUTO DATE
JUL 4 1994

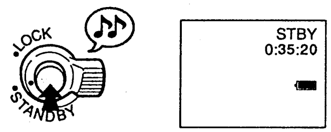
To Stop Recording Momentarily [a]

Press START/STOP again. The "STBY" indicator appears in the viewfinder (**Standby mode**).

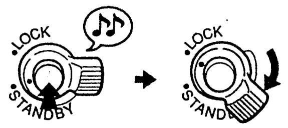
To Finish Recording [b]

Press START/STOP again. Turn STANDBY down and slide the POWER switch to OFF. The lens cover closes. Then, eject the cassette (p. 9).

[a]


LOCK
STANDBY
STBY
0:35:20

[b]


LOCK
STANDBY
LOCK
STANDBY

(See next page for further information)

Note on Standby mode

If you leave the camcorder in Standby mode for 5 minutes while the cassette is inserted, the camcorder turns off automatically. This prevents wearing down the battery and wearing out the tape. To resume Standby mode, turn STANDBY down once and turn it to up again. To start recording, press START/STOP.

Note on recording

When you record from the beginning of a tape, run the tape for about 15 seconds before starting the actual recording. This will ensure that you won't miss any start-up scenes when you play back the tape.

You can record tapes in SP (standard play) mode only.

Note on the tape counter

The tape counter indicates the recording or playback time. Use it as a guide. There will be a time lag of several seconds from the actual time. To set the counter to zero, press COUNTER RESET.

Note on beep sound

As indicated with ♪ in the illustrations, a beep sounds when you turn the power on or when you start recording and two beeps sound when you stop recording, confirming the operation. Several beeps also sound as a warning of any unusual condition of the camcorder (p. 55).

Note that the beep sound is not recorded on the tape. If you do not want to hear the beep sound, select "OFF" in the menu system.

Note on the AUTO DATE feature

The clock is set to the East Coast Standard Time at the factory, but you can reset the clock in the menu system (p. 35). You can change the AUTO DATE settings by selecting ON or OFF in the menu system.

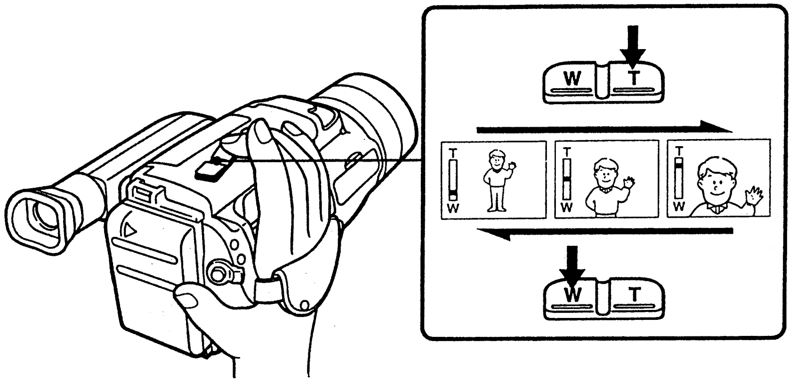
- The AUTO DATE feature works once a day. However, the date may automatically appear more than once a day when:
  - you reset the date and time.
  - you eject and insert the tape again.
  - you stop recording within 10 seconds.
  - you set AUTO DATE to OFF once and set to ON again in the menu system.
- Once the AUTO DATE feature turns off the date display 10 seconds after the start of recording, the date and time are displayed as follows:
  - If the date display setting has been made, the date is displayed.
  - If the time display setting has been made, the time is displayed.
  - If neither display setting has been made, nothing is displayed.

When moving from indoors to outdoors (or vice versa)

Turn STANDBY up and point the camcorder at a white object for about 15 seconds so that the white balance is properly adjusted.

Using the Zoom Feature

Zooming is a recording technique that lets you change the size of the subject in the scene.
For more professional-looking recordings, use the zoom function sparingly.
"T" side: for telephoto (subject appears closer)
"W" side: for wide-angle (subject appears farther away)



Zooming Speed (Dual speed zooming)

Press the power zoom button firmly for a high-speed zoom, press it softly for a relatively slow zoom.

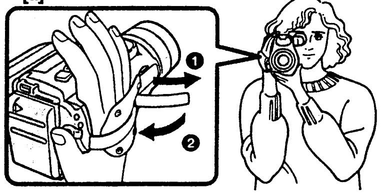
When you shoot a subject using a telephoto zoom

If you cannot get a sharp focus while in extreme telephoto zoom, press the "W" side of the power zoom button until the focus is sharp. You can shoot a subject that is at least about 3 1/4 feet (100 cm) away from the lens surface in the telephoto position, or about 1/2 inches (1 cm) in the wide-angle position.

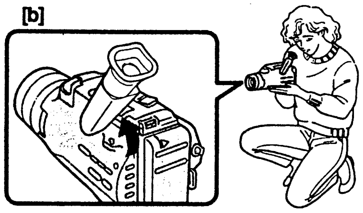
Hints for Better Shooting

For hand-held shots, you'll get better results by holding the camcorder according to the following suggestions:

[a]



[b]



- Hold the camcorder firmly and secure it with the grip strap so that you can easily manipulate the controls with your thumb. **[a]**
- Place your right elbow against your side.
- Place your left hand under the camcorder to support it.
- Place your eye firmly against the viewfinder eyecup.
- Use the viewfinder frame as a guide to determine the horizontal plane.
- You can also record in a low position to get an interesting recording angle. Lift the viewfinder up for recording from a low position. (You can turn it to 180 degrees.) **[b]**

Place the camcorder on a flat surface or use a tripod

Try placing the camcorder on a table top or any other flat surface of suitable height. If you have a tripod for a still camera, you can also use it with the camcorder (p. 50). When attaching a non-Sony tripod, make sure that the length of the tripod screw is less than 9/32 in (6.5 mm). Otherwise, the screw may damage the inner parts of the camcorder.

Using the Viewfinder as a Sports Finder

With the Sports Finder, you can monitor the picture while your eyes are at a distance from the eyecup. You can shoot scenes while moving around.

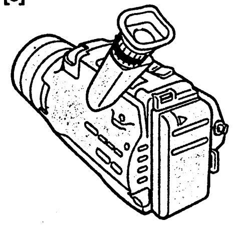
When using the viewfinder as a Sports Finder, turn the viewfinder lens adjustment ring clockwise until it stops. **[c]**

When returning to the normal viewfinder position, turn the viewfinder lens adjustment ring counterclockwise until the indicators in the viewfinder come into sharp focus.

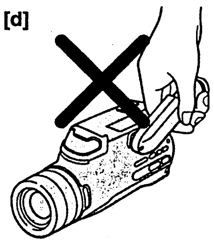
Cautions on the viewfinder

- Do not pick up the camcorder by the viewfinder. **[d]**
- Do not place the camcorder so as to point the viewfinder toward the sun. The inside of the viewfinder may be deformed. Be careful when placing the camcorder under sunlight or by the window. **[e]**

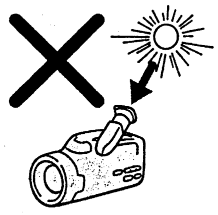
[c]



[d]



[e]



Checking the Recorded Picture

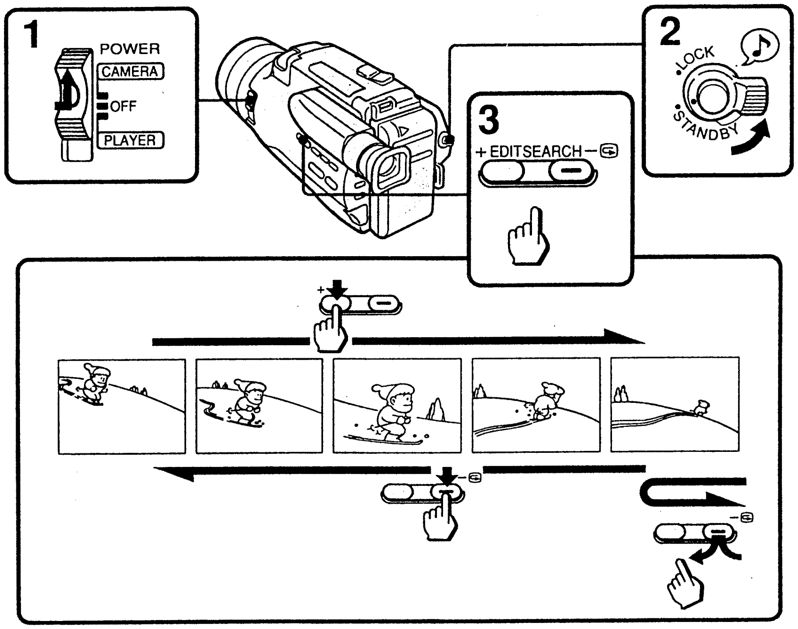
Using EDITSEARCH, you can review the last recorded scene or check the recorded picture in the viewfinder.

(1) While pressing the small green button on the POWER switch, slide it to CAMERA. **(2)** Turn STANDBY up. **(3)** Press the – (⊜) side of EDITSEARCH momentarily; the last few seconds of the recorded portion plays back (**Rec Review**).

Keep pressing EDITSEARCH to play back the last recorded portion (**Edit Search**).

+ side: to view the forward playback picture

– side: to view the reverse playback picture



To Stop Playback

Release EDITSEARCH.

To Begin Re-recording

Press START/STOP. Re-recording begins from the point you released EDITSEARCH. Provided you do not eject the tape, the transition between the last scene you recorded and the next scene you record will be smooth.

Monitoring the Sound while Viewing the Playback Picture in the Viewfinder

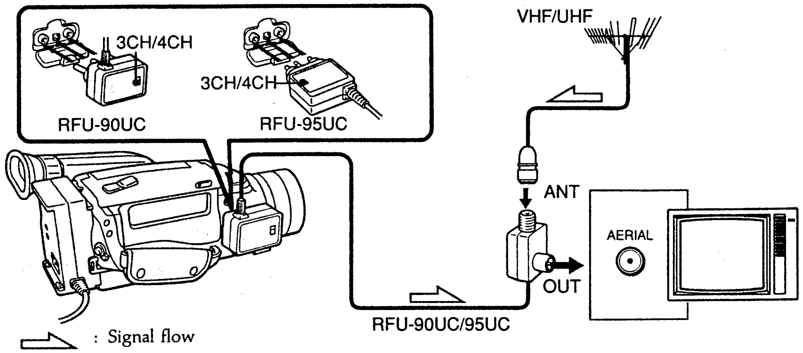
Connect earphone/headphones (not supplied) to the ⊚/∩ jack. Play back the tape in PLAYER mode (p. 18).

Connections for Playback

You can use this camcorder as a VCR by connecting it directly to your TV for playback. There are two ways to connect the camcorder to your TV. When monitoring the playback picture by connecting the camcorder to your TV, we recommend you to use house current for the power source (p. 20).

Connecting to a TV without Audio/Video Input Jacks

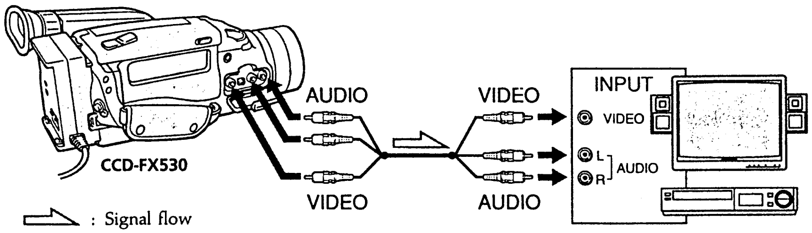
Connect the camcorder to the TV by using the supplied RFU adaptor. Set the channel selector on the RFU adaptor to 3CH or 4CH whichever is not active in your area. With this connection, the sound is in monaural.


3CH/4CH
3CH/4CH
RFU-90UC
RFU-95UC
VHF/UHF
ANT
AERIAL
OUT
RFU-90UC/95UC
: Signal flow

Connecting to a TV or a VCR with Audio/Video Input Jacks

For Stereo Model (CCD-FX530 only)

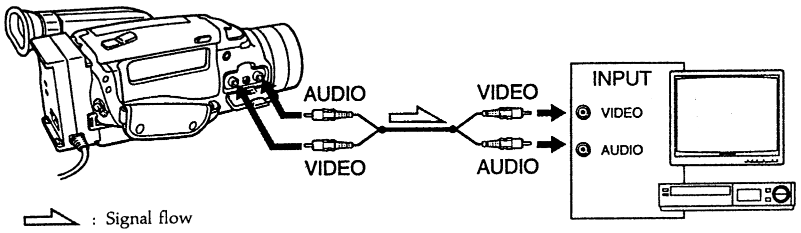
Connect the camcorder to the TV by using the A/V connecting cable (supplied). Set the TV/VCR selector on the TV to VCR. When connecting the camcorder to VCR, set the input selector on the VCR to LINE.


AUDIO
VIDEO
INPUT
VIDEO
L
R
AUDIO
CCD-FX530
VIDEO
AUDIO
: Signal flow

If your TV or VCR is a monaural type, connect only the white plug for audio on both the camcorder and the TV or the VCR. With this connection, the sound is in monaural.

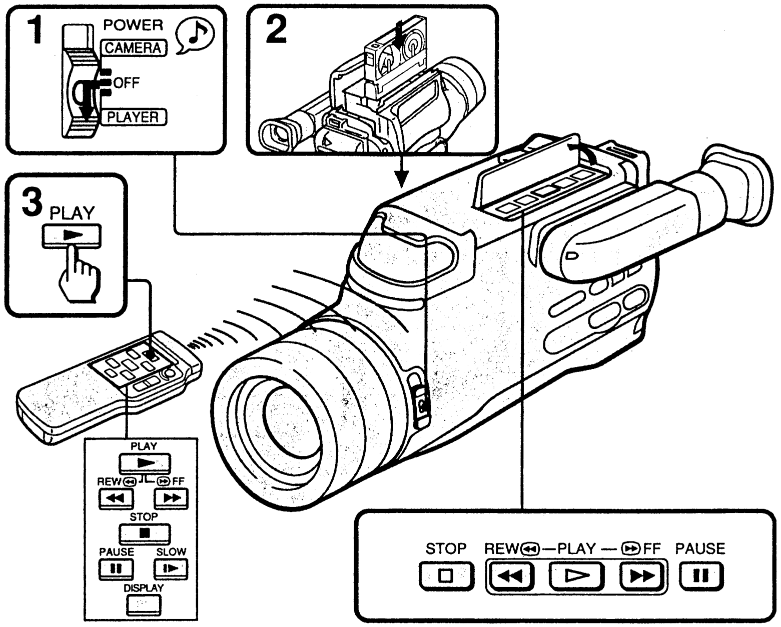
For Monaural Model

Connect the camcorder to the TV using the A/V connecting cable (not supplied). Set the TV/VCR selector on the TV to VCR.


AUDIO
VIDEO
INPUT
VIDEO
AUDIO
VIDEO
AUDIO
: Signal flow

Playing Back a Tape

You can monitor the playback picture in the viewfinder. You can also monitor the picture on a TV screen, after connecting the camcorder to a TV or VCR (p. 16). You can use the supplied Remote Commander to control playback.
(1) While pressing the small green button on the POWER switch, slide it to PLAYER. **(2)** Insert the recorded tape with the window facing out. **(3)** Press ⊳. Playback starts.



To stop playback, press □.
To rewind the tape, press ◀◀.
To advance the tape rapidly, press ▶▶.

Various Playback Modes

To view a still picture (Playback pause)
Press ❚❚ during playback. To resume playback, press ❚❚ or ⊳.

To locate a scene (Picture search)
Keep pressing ◀◀ or ▶▶ during playback. To resume normal playback, release the button.

To monitor the high-speed picture while advancing the tape or rewinding (Skip scan)
Keep pressing ◀◀ while rewinding or ▶▶ while advancing the tape. To resume normal playback, press ⊳.

To view the picture in a sequence of stop-motion images
Press EDITSEARCH in Playback pause mode. If you keep pressing EDITSEARCH, you can view the picture play back in the forward (+) or reverse (–) direction.

To view the picture at 1/5 speed (Slow Playback) (only with the Remote Commander)
Press I▶ on the Remote Commander during playback. To resume normal playback, press ▶. If slow playback lasts for about 1 minute, it shifts to normal speed automatically.

Note on playback
- Streaks appear and the sound is muted in the various playback modes.
- When Playback pause mode lasts for 5 minutes, the camcorder automatically enters stop mode.

To display the viewfinder screen indicators on the TV
Press DISPLAY on the Remote Commander. To erase the indicators, press DISPLAY again.

To select the playback sound — For stereo model (CCD-FX530 only)
Change the "HiFi SOUND" mode setting in the menu system (p. 31).

Advanced Operations

Using Alternative Power Sources

You can choose any of the following power sources for your camcorder: battery pack (p. 6), house current, and 12/24 V car battery. Choose the appropriate power source depending on where you want to use your camcorder.

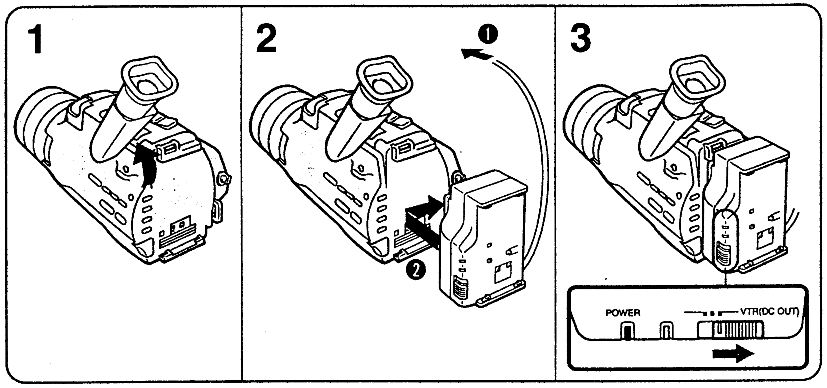
Place	Power source	Accessory to be used
Indoors	House current	AC power adaptor AC-V25/V25A/V25B (supplied), AC-S10, AC-V55
Outdoors	Battery pack	Battery pack NP-55 (supplied), NP-55H, NP-60D, NP-66H, NP-77H, NP-80/80D
In the car	12 V or 24 V car battery	DC pack DCP-77

Note on power sources

Disconnecting the power source or removing the battery pack during recording or playback may damage the inserted tape. If this happens, restore the power supply again immediately.

Using House Current

To use the supplied AC-V25/V25A/V25B AC power adaptor:
(1) Lift up the viewfinder. **(2)** Connect the AC power cord to a wall outlet. Connect the bottom of the AC power adaptor to the battery mounting surface of the camcorder. **(3)** Set the selector to VTR (DC OUT).



Notes on the POWER lamp

- The POWER lamp will remain lit for a while even if the unit is unplugged after use. This is normal.
- If the POWER lamp does not light, set the selector to the center position and disconnect the power cord. After about one minute, reconnect the power cord and set the selector to VTR (DC OUT) again.

To remove the adaptor

The adaptor is removed in the same way as the battery pack. (p. 8)

Using a Car Battery

Use the DCP-77 DC pack (not supplied). Connect the cord of the DC pack to the cigarette lighter socket of the car (12 V or 24 V). Connect the DC pack to the battery mounting surface of the camcorder.

To remove the DC pack

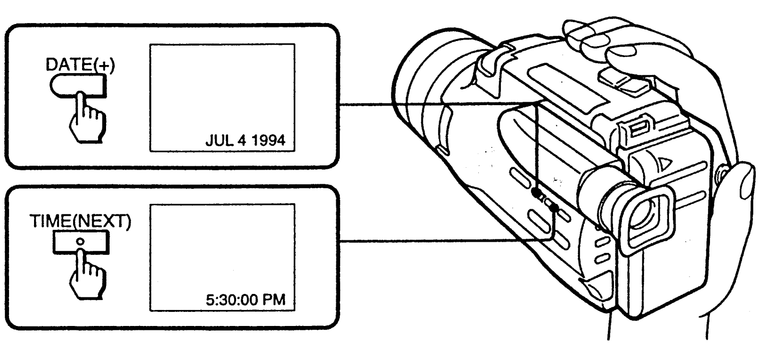
The DC pack is removed in the same way as the battery pack. (p. 8)

Options for Charging the Battery Pack

- AC-S10 AC power adaptor:
  You can charge a battery pack whether it is used up or not with this adaptor because it has a discharging function.
- BC-S10 portable battery charger (ideal for travel):
  You can charge a battery pack on 100 — 240 V AC current.

Recording with the Date or Time

Before you start recording, press DATE (+) or TIME (NEXT). You can record the date or time displayed in the viewfinder with the picture. You cannot record the date and time at the same time. Except for the date, time or age indicator, no indicator in the viewfinder is recorded.
The clock is set to the East Coast Standard Time at the factory, but you can reset the clock in the menu system (p. 35).

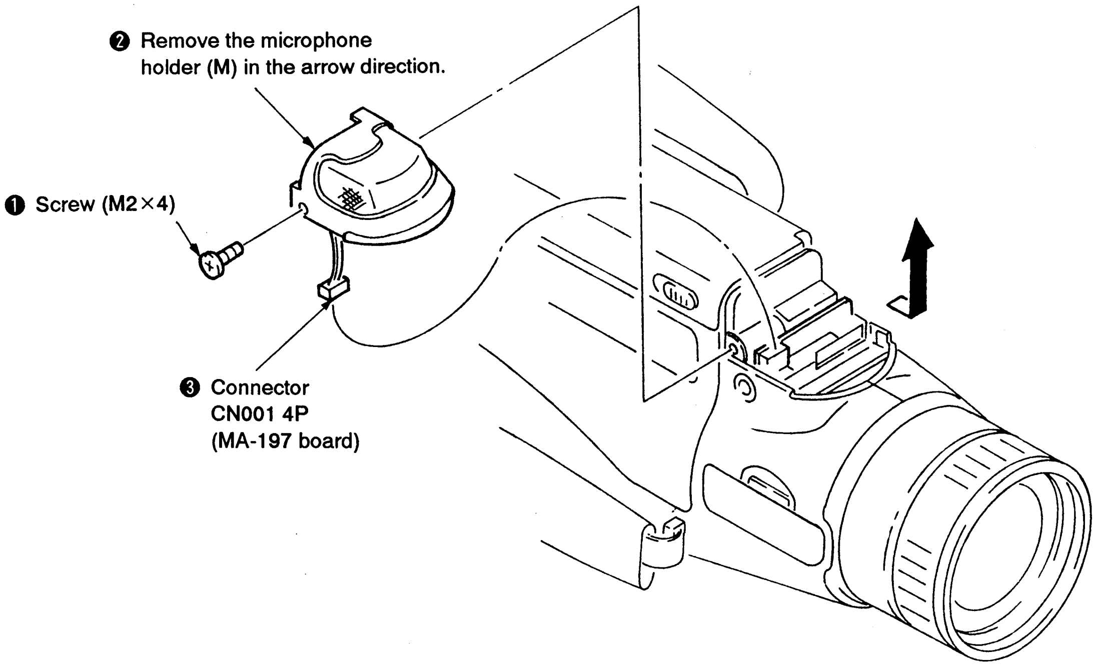


To Stop Recording with the Date or Time

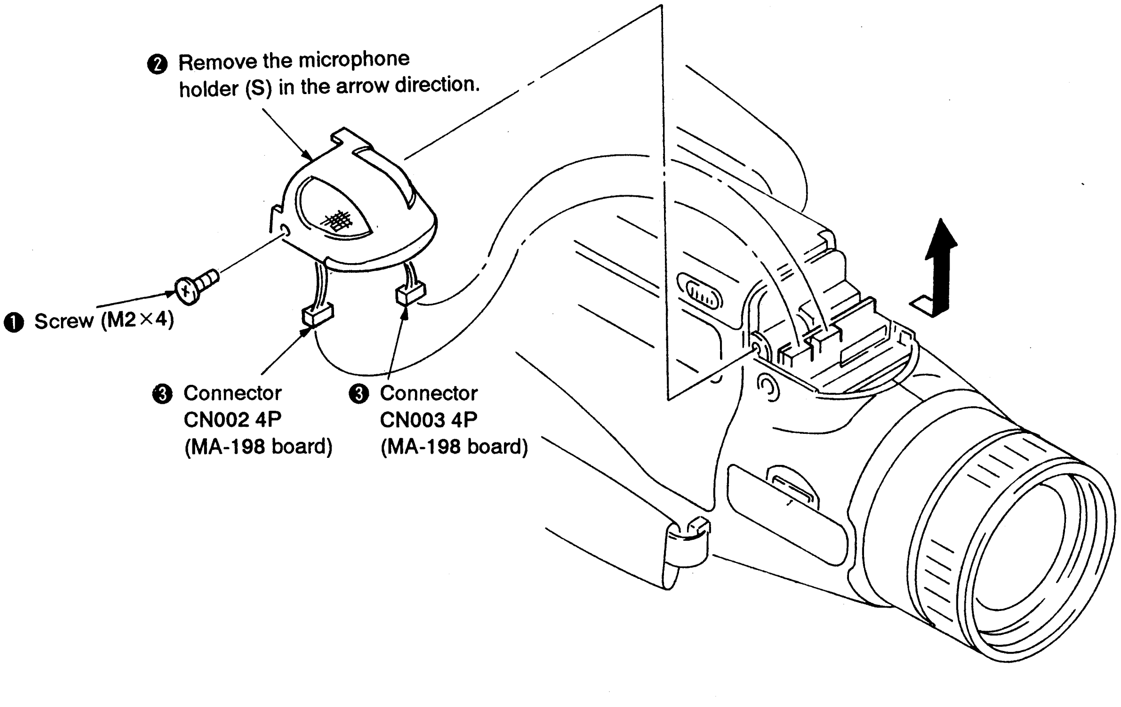
Press DATE (+) or TIME (NEXT) again. The date or time indicator disappears. The recording continues.

SECTION 2
DISASSEMBLY

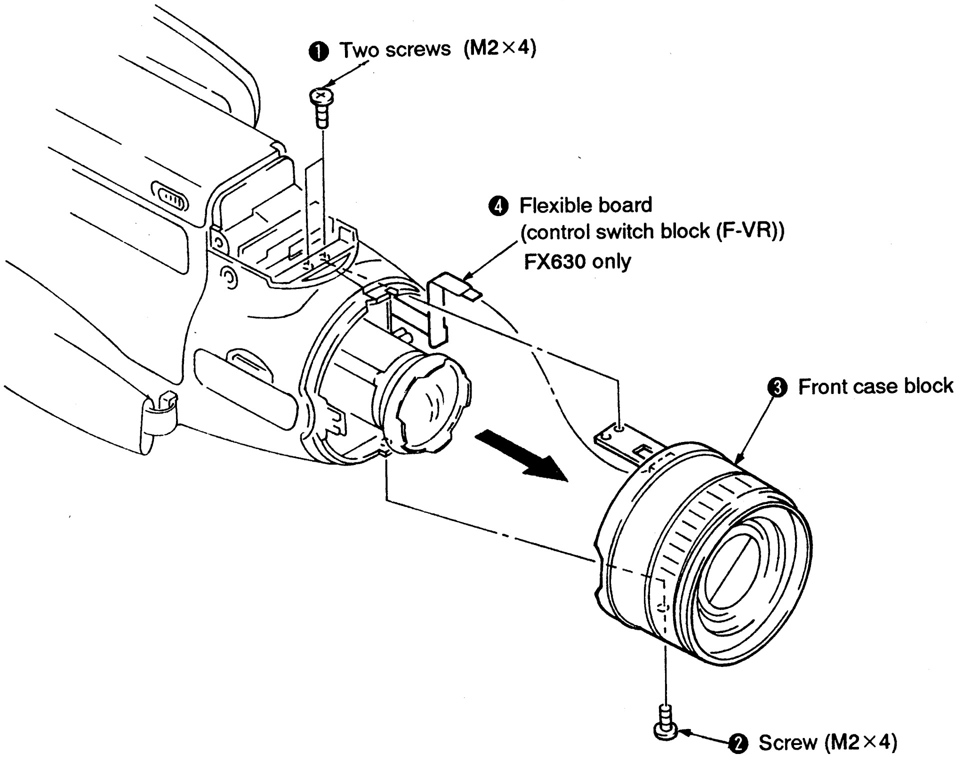
2-1. REMOVAL OF MICROPHONE HOLDER (M) (FX430/FX435/FX630)


❷ Remove the microphone holder (M) in the arrow direction.
❶ Screw (M2×4)
❸ Connector
CN001 4P
(MA-197 board)

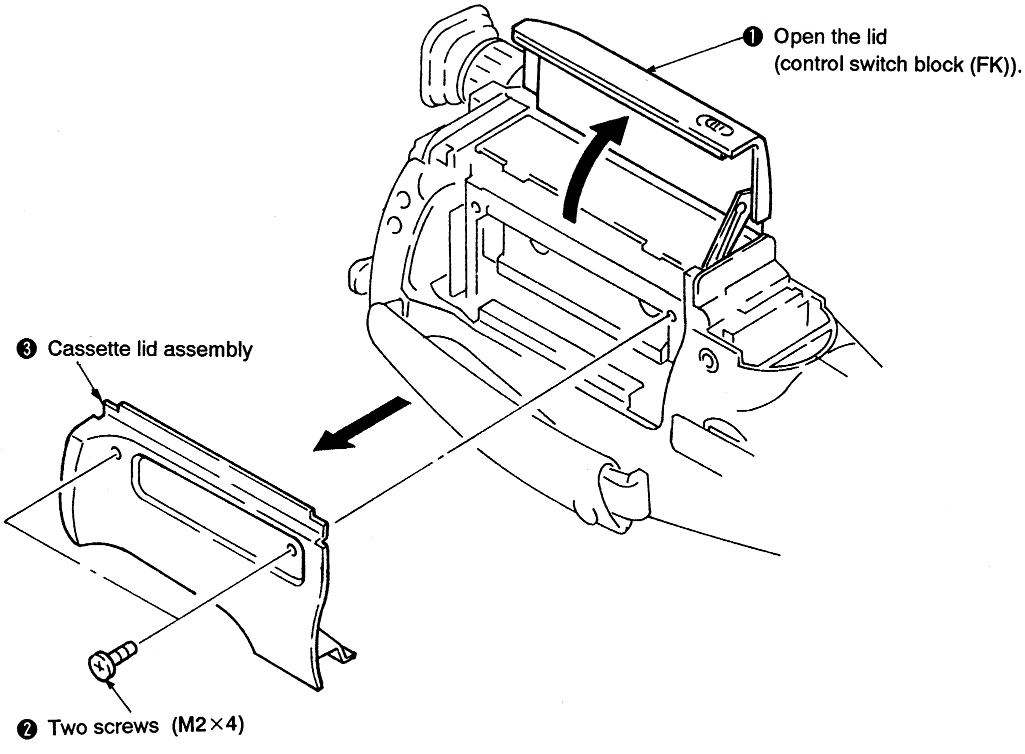
2-1. REMOVAL OF MICROPHONE HOLDER (S) (FX530)


❷ Remove the microphone holder (S) in the arrow direction.
❶ Screw (M2×4)
❸ Connector
CN002 4P
(MA-198 board)
❸ Connector
CN003 4P
(MA-198 board)

2-2. REMOVAL OF FRONT CASE BLOCK

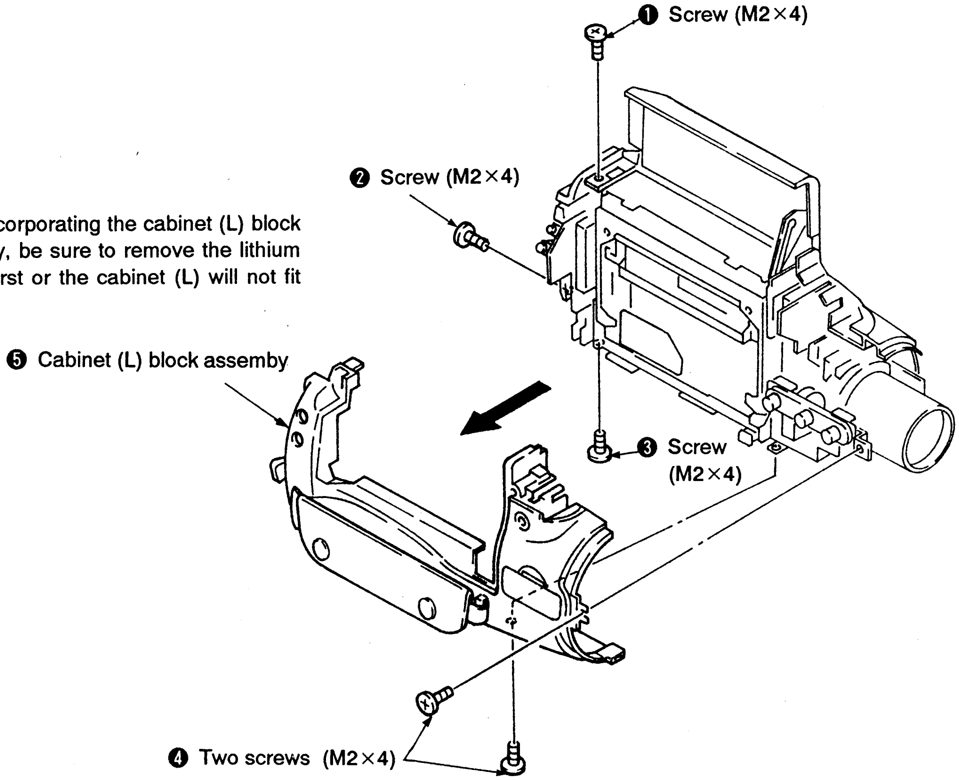

❶ Two screws (M2×4)
❹ Flexible board
(control switch block (F-VR))
FX630 only
❸ Front case block
❷ Screw (M2×4)

2-3. REMOVAL OF CASSETTE LID ASSEMBLY

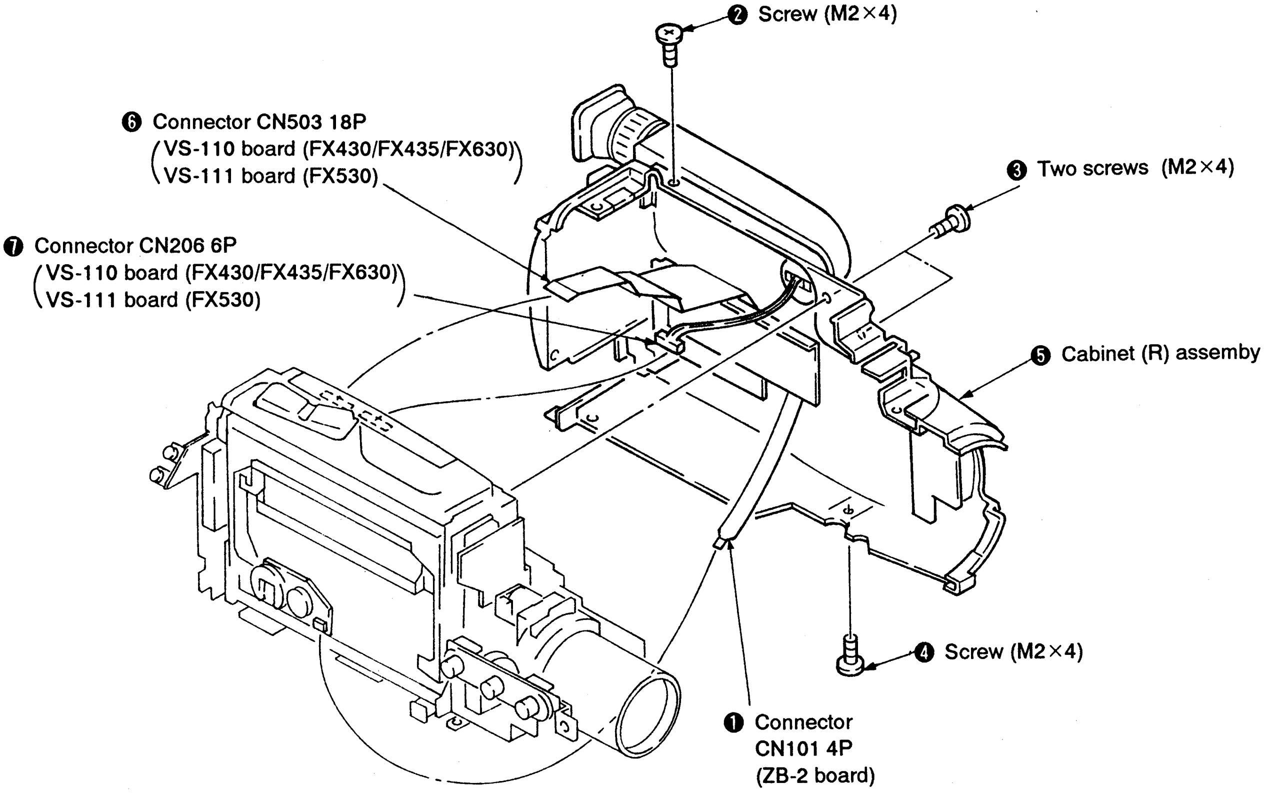

❶ Open the lid
(control switch block (FK)).
❸ Cassette lid assembly
❷ Two screws (M2×4)

2-4. REMOVAL OF CABINET (L) BLOCK ASSEMBLY

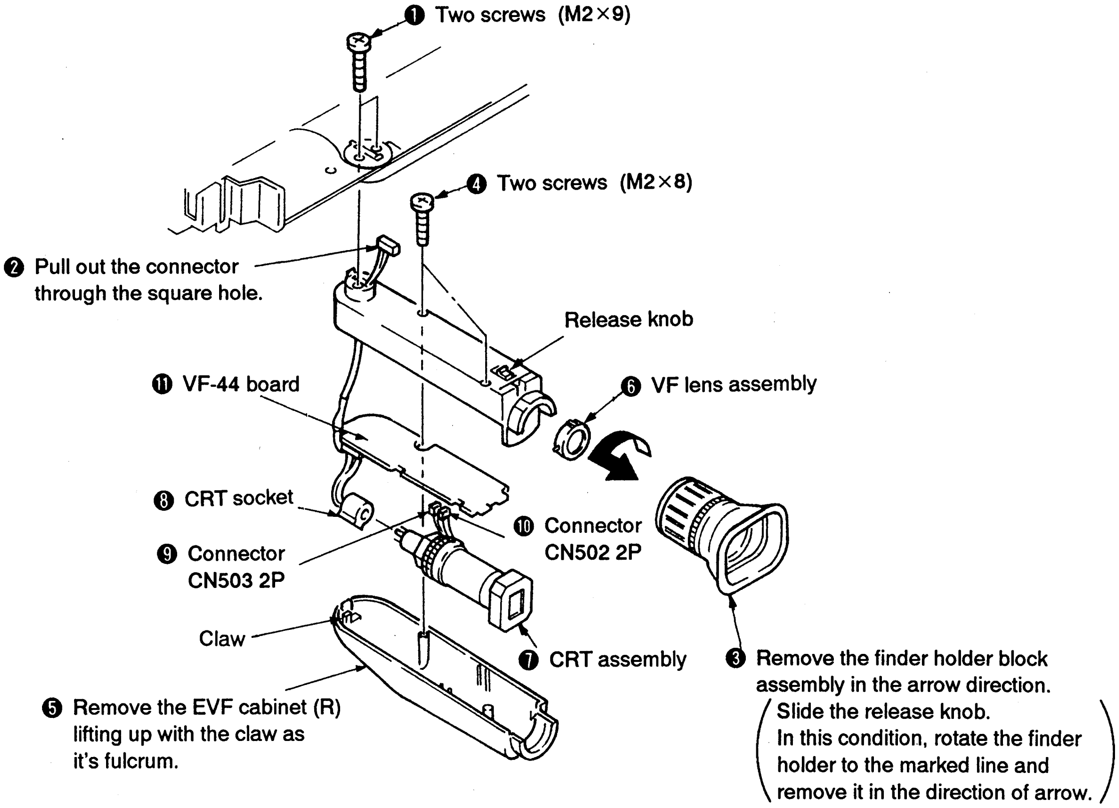
Note: When incorporating the cabinet (L) block assembly, be sure to remove the lithium battery first or the cabinet (L) will not fit properly.


① Screw (M2×4)
② Screw (M2×4)
⑤ Cabinet (L) block assemby
③ Screw (M2×4)
④ Two screws (M2×4)

2-5. REMOVAL OF CABINET (R) ASSEMBLY

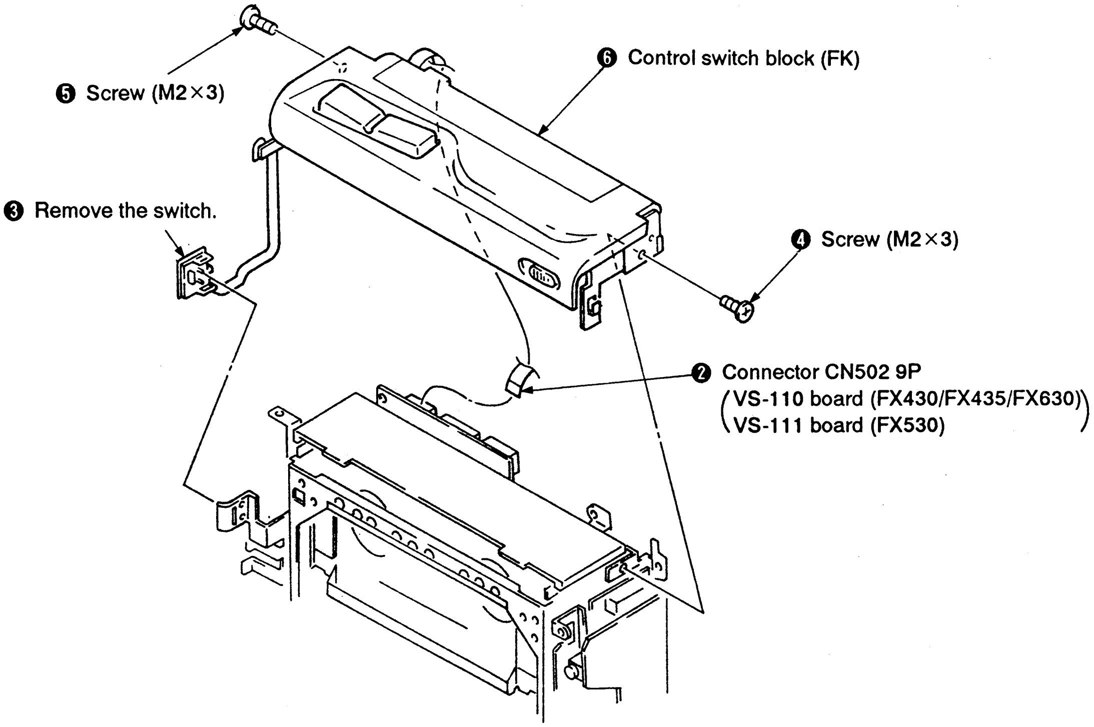

② Screw (M2×4)
⑥ Connector CN503 18P (VS-110 board (FX430/FX435/FX630) VS-111 board (FX530))
③ Two screws (M2×4)
⑦ Connector CN206 6P (VS-110 board (FX430/FX435/FX630) VS-111 board (FX530))
⑤ Cabinet (R) assemby
④ Screw (M2×4)
① Connector CN101 4P (ZB-2 board)

2-6. REMOVAL OF EVF ASSEMBLY (VF-44 BOARD)

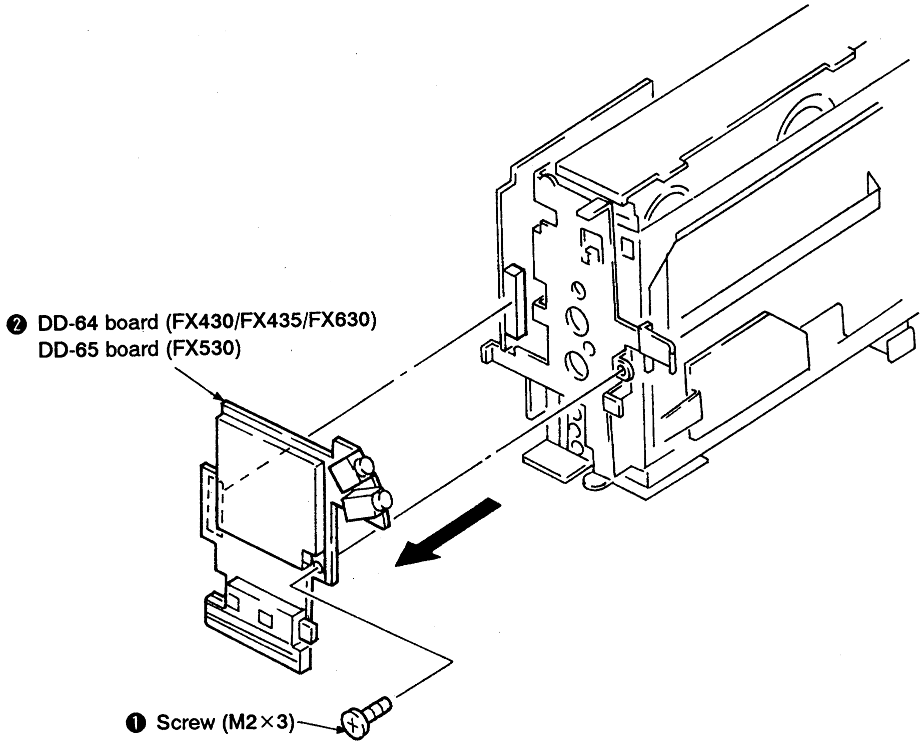

❶ Two screws (M2×9)
❹ Two screws (M2×8)
❷ Pull out the connector through the square hole.
Release knob
⓫ VF-44 board
❻ VF lens assembly
❽ CRT socket
❿ Connector CN502 2P
❾ Connector CN503 2P
Claw
❼ CRT assembly
❸ Remove the finder holder block assembly in the arrow direction.
(Slide the release knob.
In this condition, rotate the finder holder to the marked line and remove it in the direction of arrow.)
❺ Remove the EVF cabinet (R) lifting up with the claw as it's fulcrum.

2-7. REMOVAL OF CONTROL SWITCH BLOCK (FK)

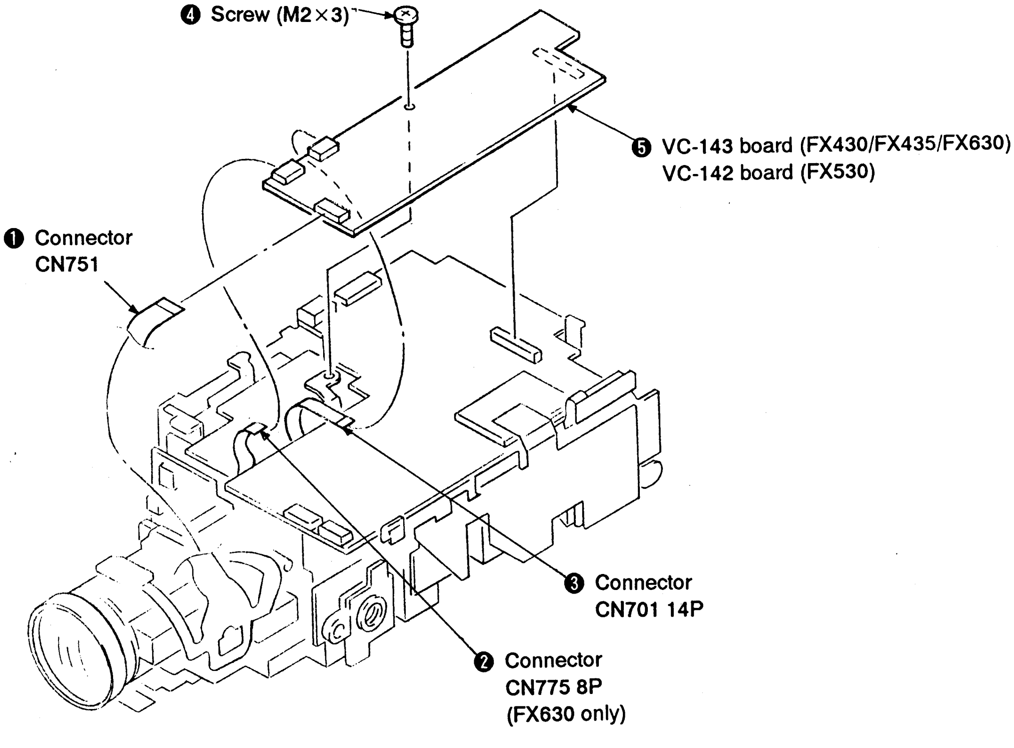
Note: ❶ Refer to 2-7 and remove the
DD-64 board (FX430/FX435/FX630),
DD-65 board (FX530)


❺ Screw (M2×3)
❻ Control switch block (FK)
❸ Remove the switch.
❹ Screw (M2×3)
❷ Connector CN502 9P
(VS-110 board (FX430/FX435/FX630)
VS-111 board (FX530))

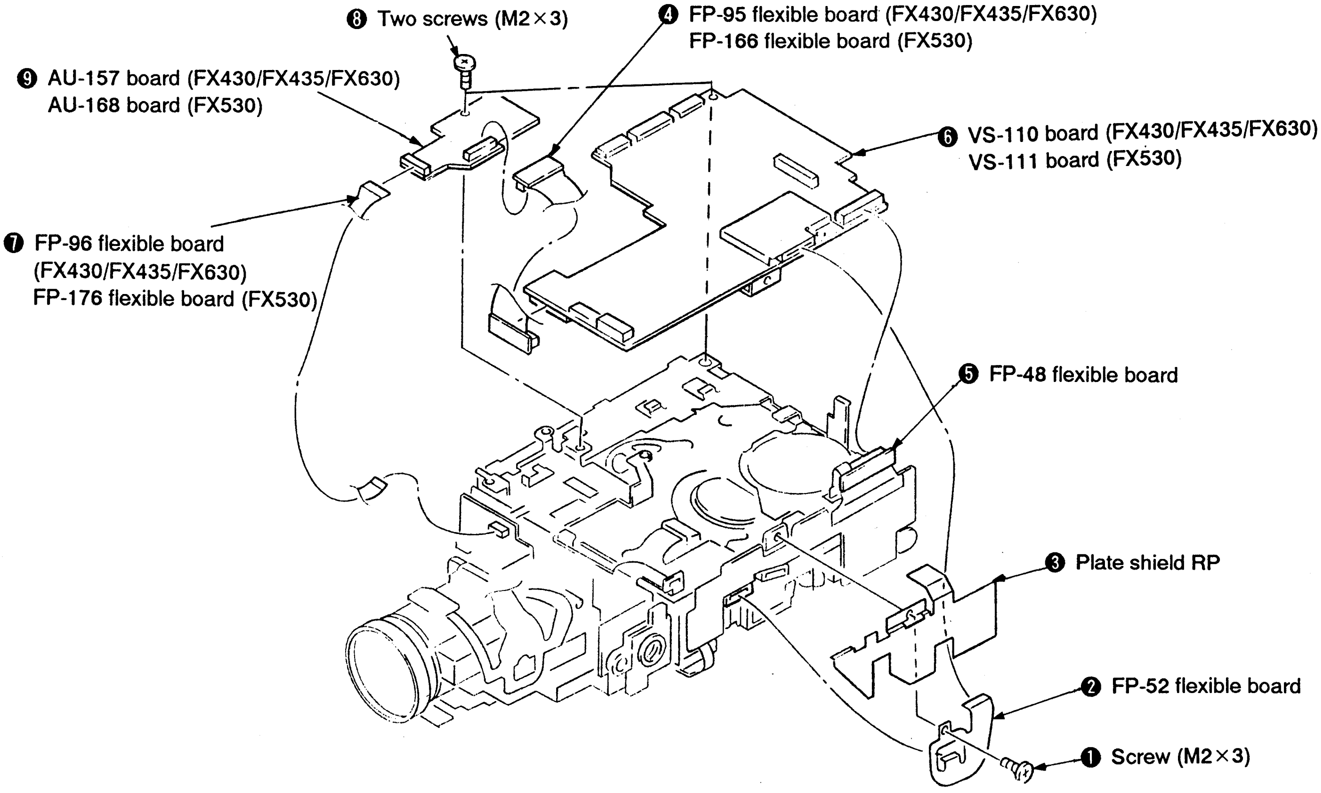
2-8. REMOVAL OF DD-64 BOARD (FX430/FX435/FX630) REMOVAL OF DD-65 BOARD (FX530)


❷ DD-64 board (FX430/FX435/FX630)
DD-65 board (FX530)
❶ Screw (M2×3)

2-9. REMOVAL OF VC-143 BOARD (FX430/FX435/FX630) REMOVAL OF VC-142 BOARD (FX530)

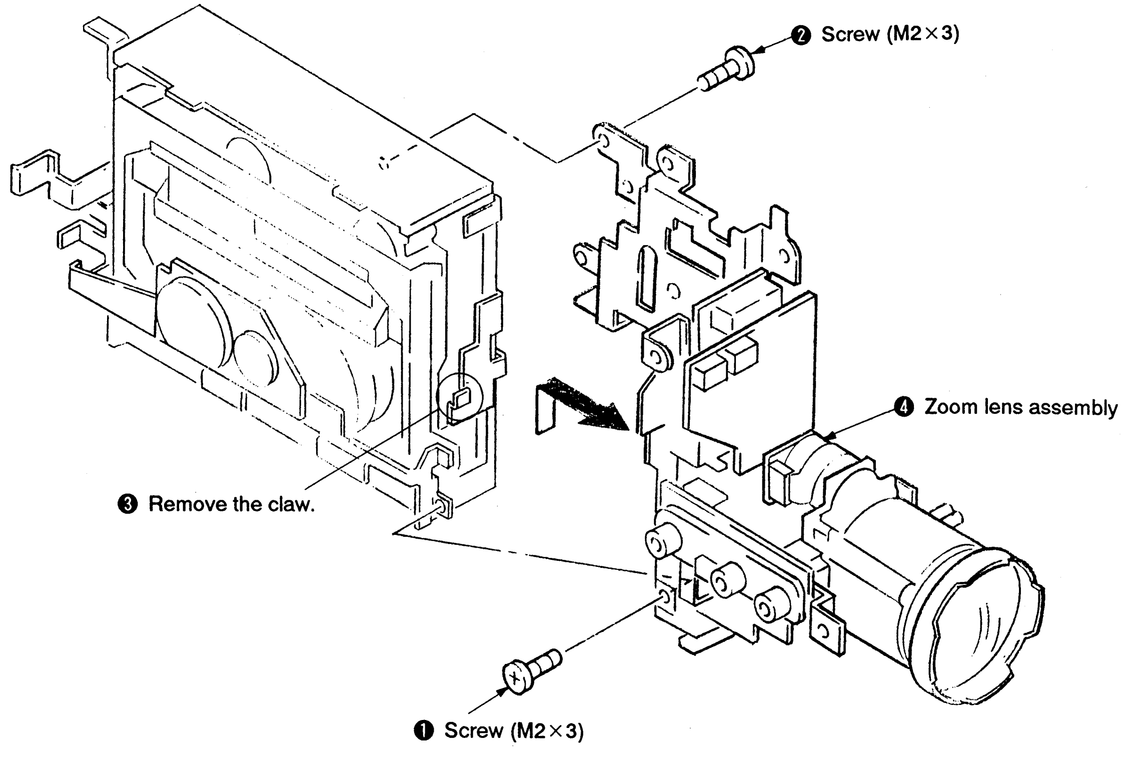

❹ Screw (M2×3)
❺ VC-143 board (FX430/FX435/FX630)
VC-142 board (FX530)
❶ Connector
CN751
❸ Connector
CN701 14P
❷ Connector
CN775 8P
(FX630 only)

2-10. REMOVAL OF VS-110 AND AU-157 BOARD (FX430/FX435/FX630) REMOVAL OF VS-111 AND AU-168 BOARD (FX530)



❽ Two screws (M2×3)
❹ FP-95 flexible board (FX430/FX435/FX630)
FP-166 flexible board (FX530)
❾ AU-157 board (FX430/FX435/FX630)
AU-168 board (FX530)
❻ VS-110 board (FX430/FX435/FX630)
VS-111 board (FX530)
❼ FP-96 flexible board
(FX430/FX435/FX630)
FP-176 flexible board (FX530)
❺ FP-48 flexible board
❸ Plate shield RP
❷ FP-52 flexible board
❶ Screw (M2×3)

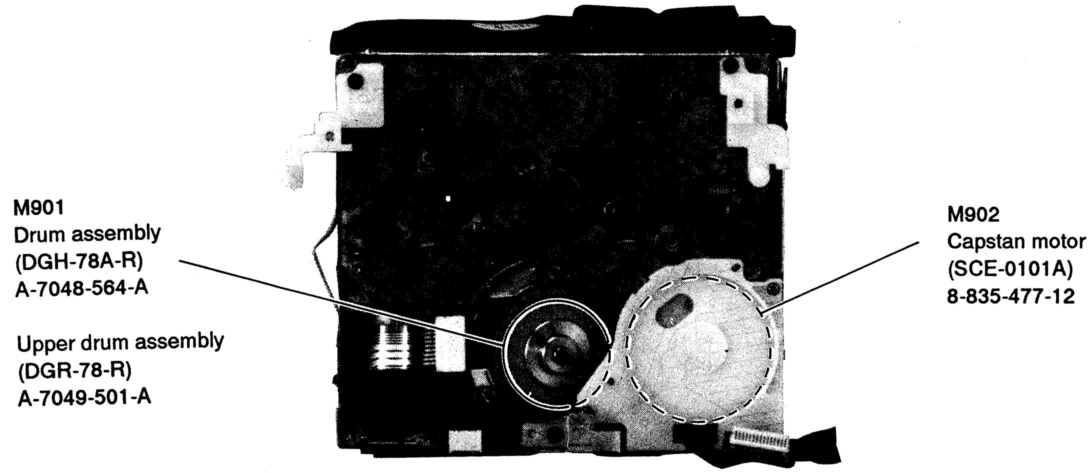
2-11. REMOVAL OF ZOOM LENS BLOCK ASSEMBLY



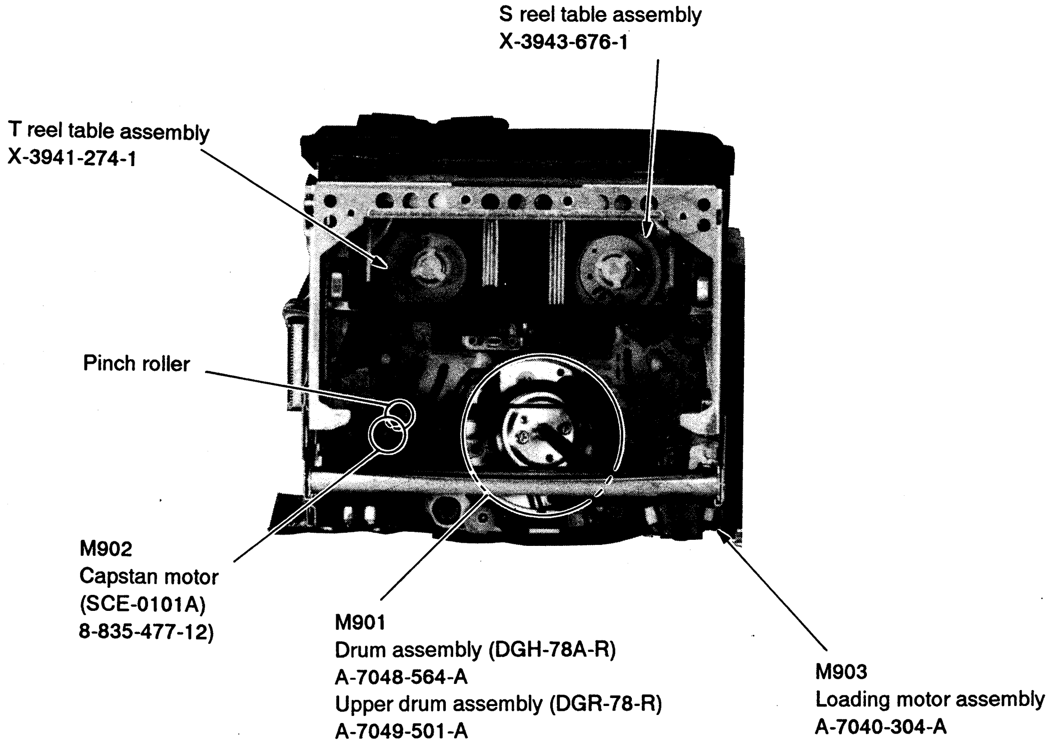
❷ Screw (M2×3)
❹ Zoom lens assembly
❸ Remove the claw.
❶ Screw (M2×3)

2-12. INTERNAL VIEWS

— Right side —


M901
Drum assembly
(DGH-78A-R)
A-7048-564-A
Upper drum assembly
(DGR-78-R)
A-7049-501-A
M902
Capstan motor
(SCE-0101A)
8-835-477-12

— Left side —


S reel table assembly
X-3943-676-1
T reel table assembly
X-3941-274-1
Pinch roller
M902
Capstan motor
(SCE-0101A)
8-835-477-12)
M901
Drum assembly (DGH-78A-R)
A-7048-564-A
Upper drum assembly (DGR-78-R)
A-7049-501-A
M903
Loading motor assembly
A-7040-304-A

English
94C0936-1
Printed in Japan
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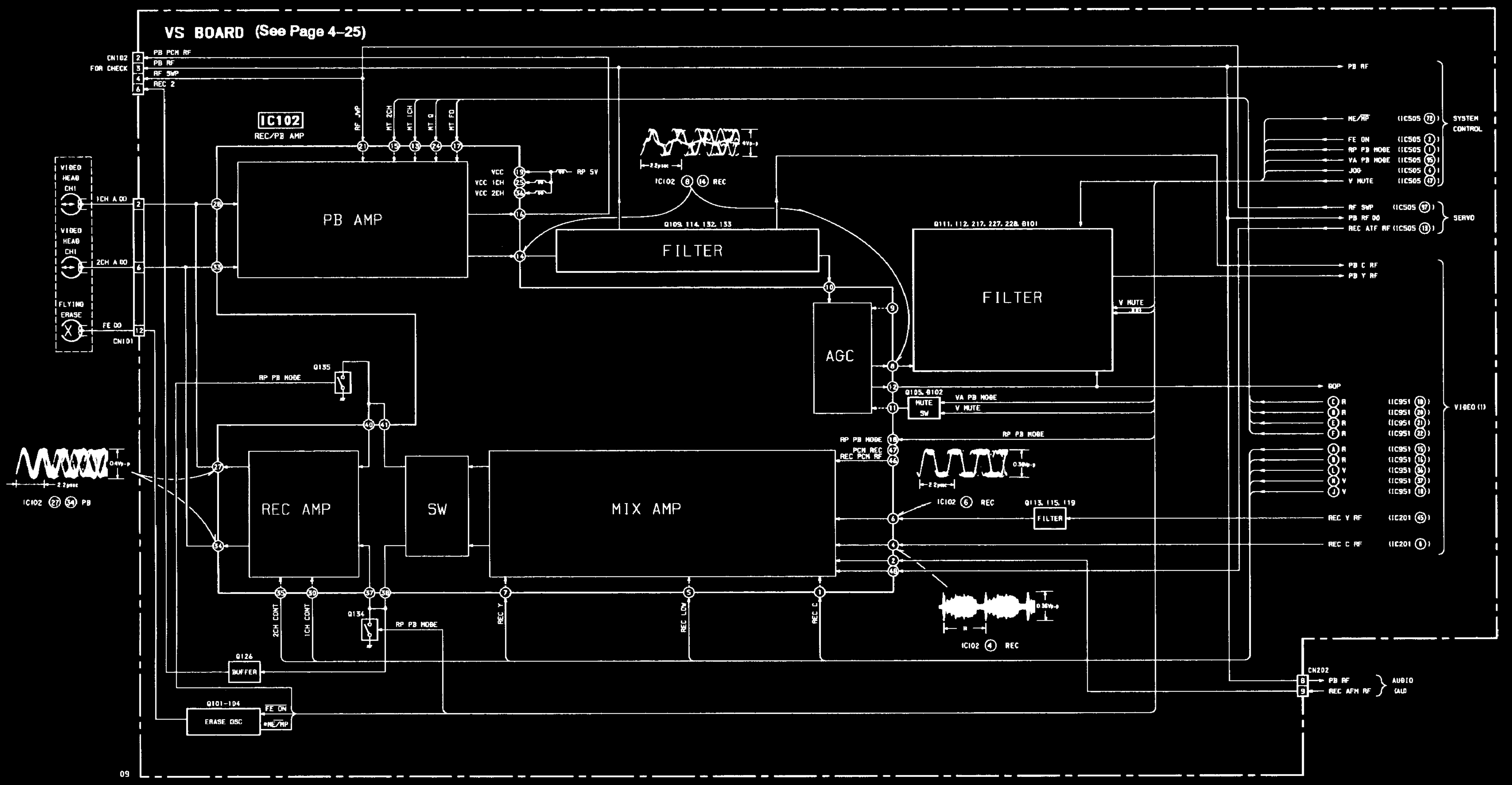
Published by CV Quality Engineering DIV.

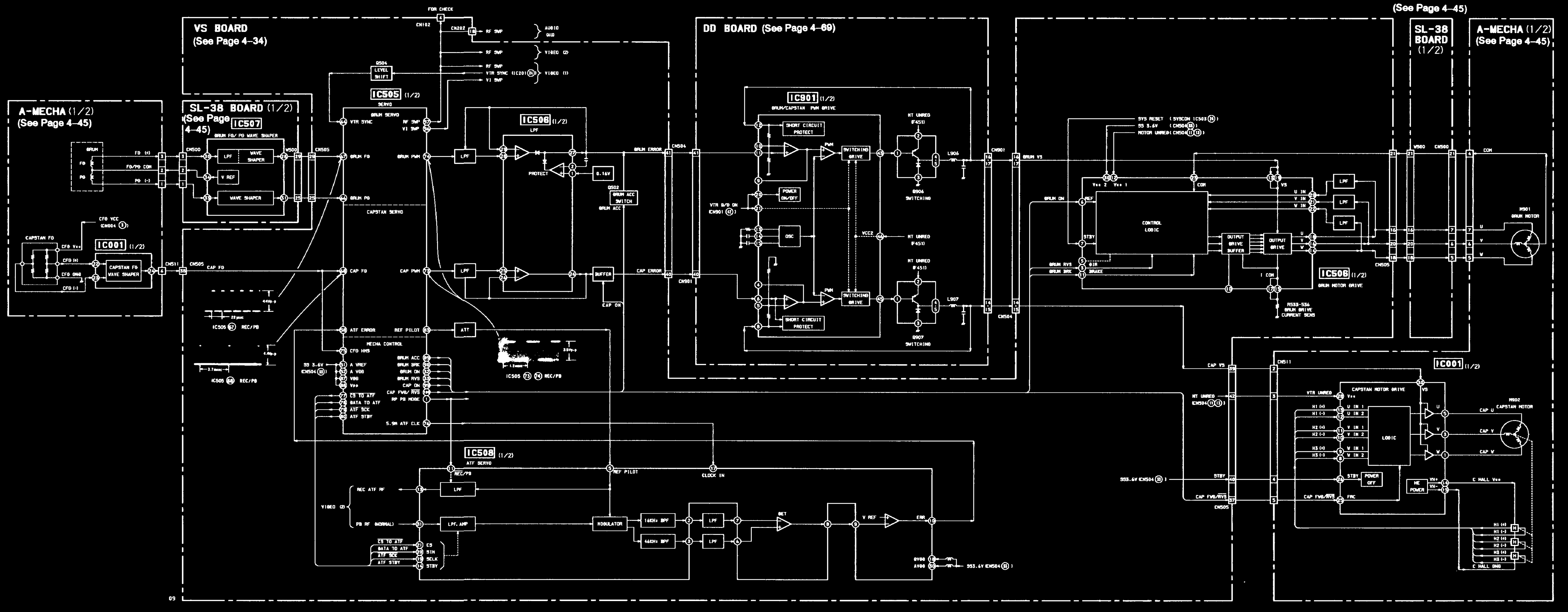
Sony Corporation
Personal Video Group

9-973-530-11

3-4. VIDEO (2) BLOCK DIAGRAM


VS BOARD (See Page 4-25)
IC102
REC/PB AMP
PB AMP
FILTER
FILTER
AGC
REC AMP
SW
MIX AMP
VIDEO HEAD
FLYING ERASE
ERASE OSC
BUFFER
SYSTEM CONTROL
SERVO
VIDEO (1)
AUDIO (A4)

3-5. SERVO BLOCK DIAGRAM


A-MECHA (1/2) (See Page 4-45)
VS BOARD (See Page 4-34)
SL-38 BOARD (1/2) (See Page 4-45)
IC507
IC505 (1/2)
IC506 (1/2)
IC001 (1/2)
IC508 (1/2)
DD BOARD (See Page 4-69)
IC801 (1/2)
(See Page 4-45)
SL-38 BOARD (1/2)
A-MECHA (1/2) (See Page 4-45)
IC508 (1/2)
IC001 (1/2)
CONTROL LOGIC
LOGIC
DRUM MOTOR
CAPSTAN MOTOR

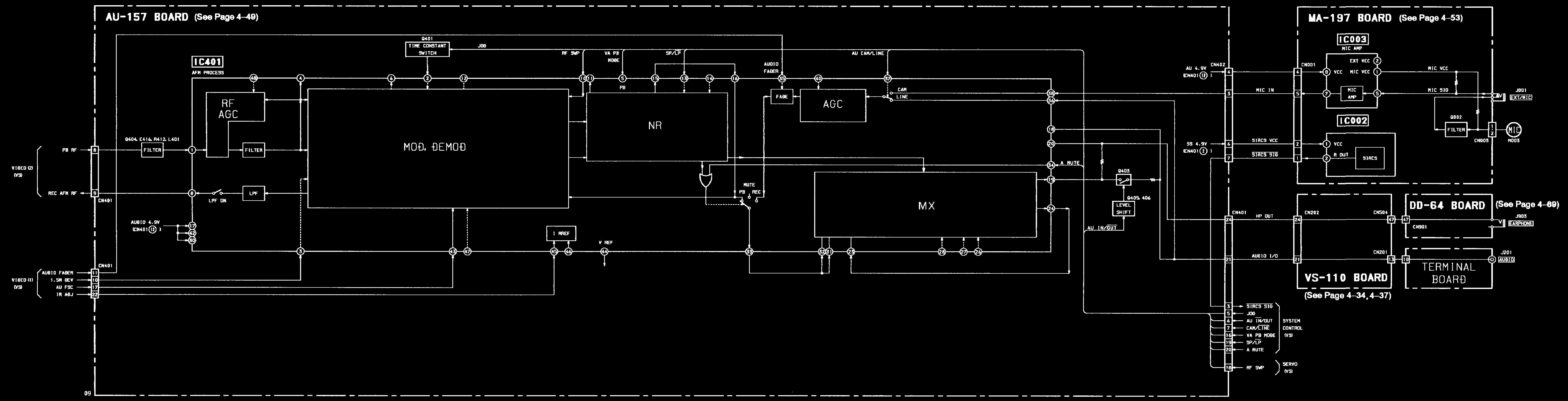
3-6. SYSTEM CONTROL BLOCK DIAGRAM

VS BOARD
(See Page 4-34)
IC503
MODE CONTROL (MASTER)
IC501
EEP ROM
IC502
IC505
SERVO/SYSTEM CONTROL
IC508
CONTROL SWITCH BLOCK (FK)
CONTROL SWITCH BLOCK (CK)
F.VR BLOCK
(See Page 4-41)
ZB-2 BOARD
(See Page 4-53, 4-61)
MA BOARD
IC002
(See Page 4-49, 4-57)
AU BOARD
DD BOARD
(See Page 4-69)
IC507
SL-38 BOARD (1/2)
(See Page 4-45)
SL-38 BOARD (1/2)
(See Page 4-45)
IC507
(See Page 4-45)
A-MECHA CHASSIS
LM-40 BOARD
(See Page 4-45)
LS-33 BOARD
(See Page 4-45)
EVF
CAMERA
VIDEO (1)
VIDEO (2)
AUDIO

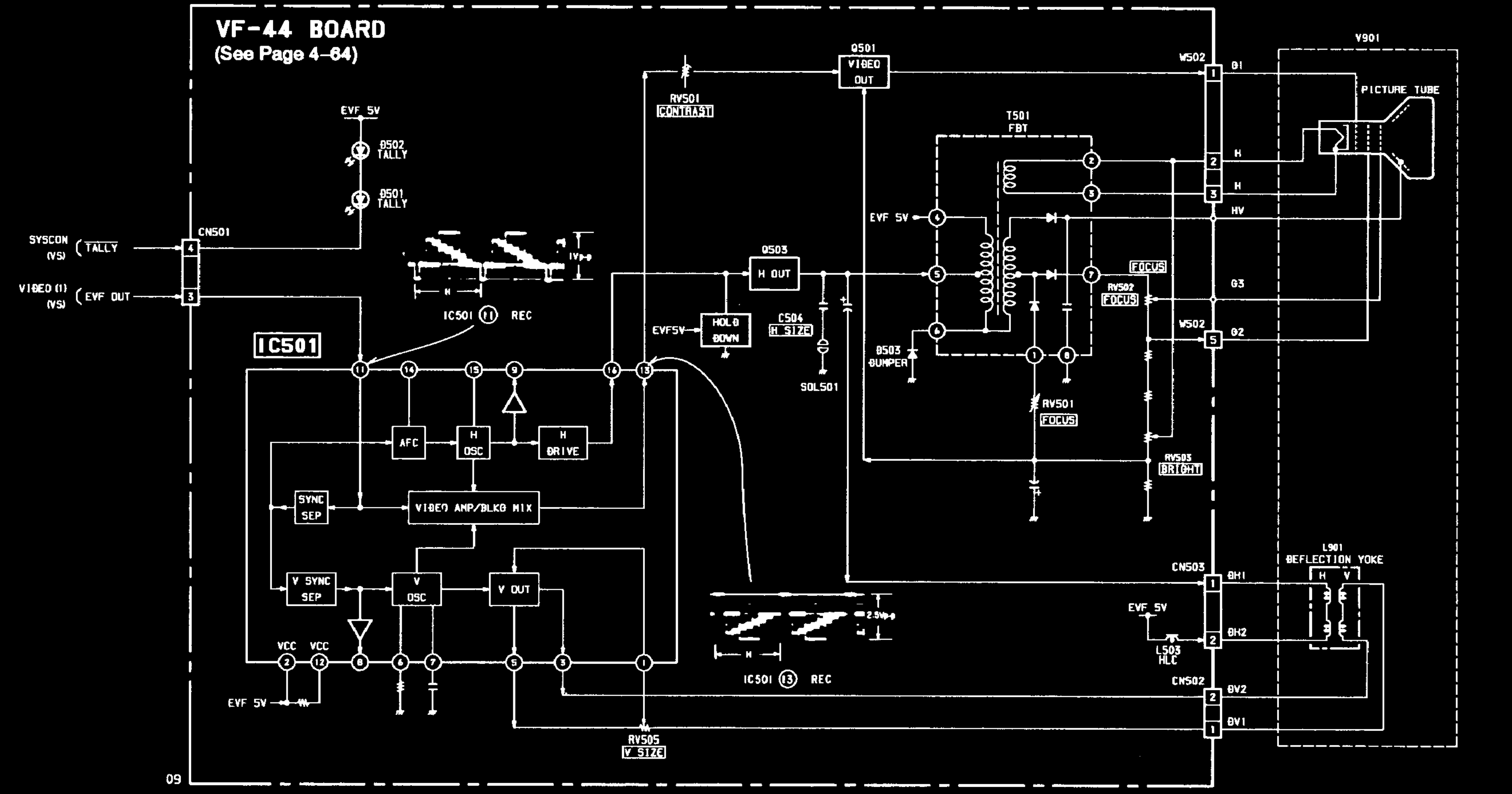
3-7. AUDIO (ST) BLOCK DIAGRAM

AU-168 BOARD
(See Page 4-57)
IC1301
AFM PROCESS
Q1315
TIME CONSTANT SWITCH
JOG
CL1320
MONITOR
MODE
NR
ALC
MX
MOD/DEMOD
NR
REG
BUFFER
FILTER
CN1302
Q1320
FL402, Q1318/FL1302, Q1319
PB 1.5M
PB 1.7M
PB RF
REC AFM RF
AUDIO FADER
VIDEO (2)
VIDEO (1)
1.5M DEV
MX ADJ
1.7M DEV
AU FSC
REC AFM RF
MONO REC
AU FSC
RF SWP
1.7M DEV
MAT ADJ
AUDIO FADER
MIC L
LINE L
MODE
MIC R
LINE R
CAM/LINE
LINE MIX
Q1316
Q1317
Q1312, 1313
BUFFER
AU IN/OUT
SP/LP
MX ON/OFF
SEL1
SEL2
AUDIO MUTE
VA PB MODE
VCC
AUDIO 4.9V
LINE VCC
REC MT ADJ
2.1V
MA-198 BOARD
(See Page 4-61)
IC001
MIC AMP
BUFFER
MIC A EQ AMP
INVERT AMP
ATT
MIC AMP
INT
EXT
HPF ON
EXT MONO
EXT/INT
HF CONT
BIAS
MIC B EQ AMP
INT MIC L
INT MIC R
MIC L
MIC R
J001
EXT MIC
IC002
SIRCS
VCC
R OUT
Q003
CN001
CN002
CN003
CN1501
SS 4.9V
SIRCS VCC
MIC MONO
SIRCS SIG
WIND
(See Page 4-34, 4-37)
VS BOARD
(See Page 4-69)
DD-65 BOARD
J003
PHONES
HP R
HP L
CN594
CN901
AUDIO L I/O
AUDIO R I/O
CN202
CN201
AUDIO I/O L
AUDIO I/O R
J201
AUDIO L (MONO)
AUDIO R
SIRCS SIG
SYSTEM CONTROL (V9)
JACK MONO
TERMINAL BOARD
JACK MONO
WIND
MIC MONO
PB 1.7M SET
JOG
AU IN/OUT
LINE MIX
SEL 2
MONO REC
MX ON/OFF
SEL 1
A MUTE
SP/LP
VA PB MODE
CAM/LINE
RF SWP
SYSTEM CONTROL (V9)
SERVO (V9)

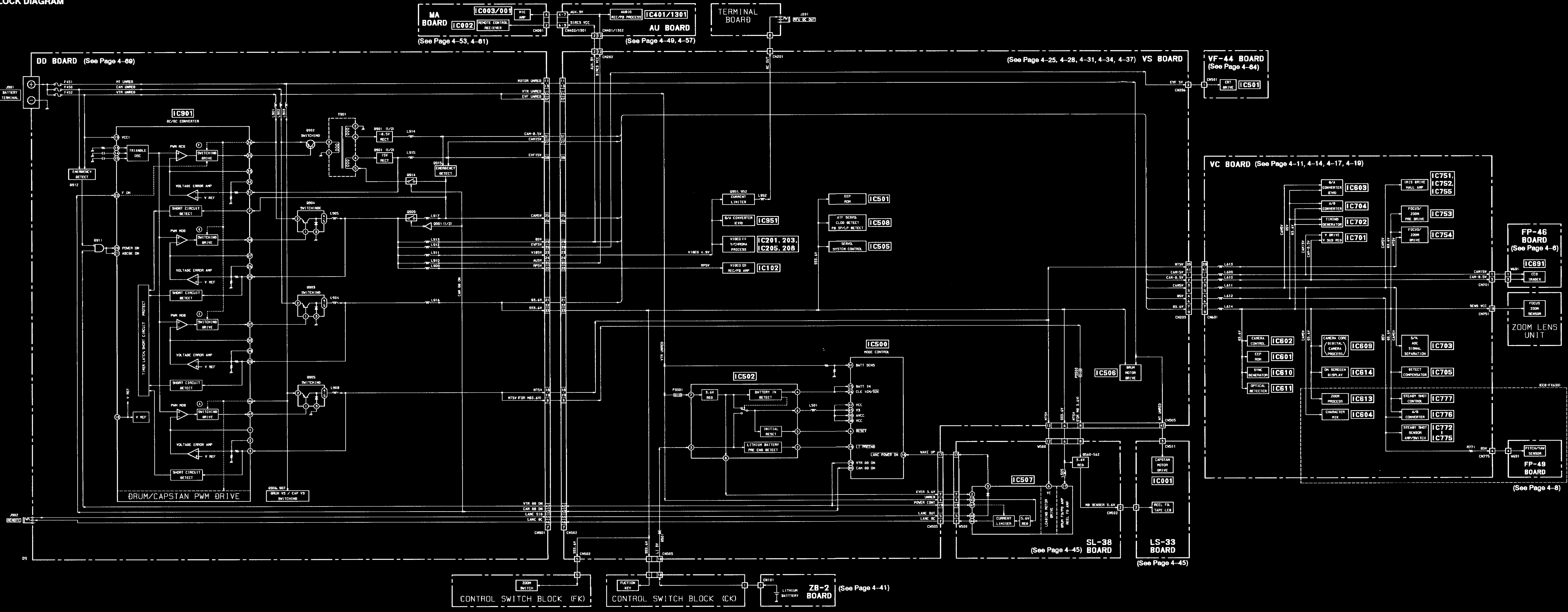
3-8. AUDIO (MONO) BLOCK DIAGRAM


AU-157 BOARD (See Page 4-49)
IC401
AFM PROCESS
RF AGC
FILTER
LPF
LPF ON
Q404, C416, R412, L401
MOD, DEMOD
NR
AGC
FADE
MX
I RREF
V REF
Q401
TIME CONSTANT SWITCH
JOG
RF SWP
VA PB MODE
SP/LP
AUDIO FADER
AU CAM/LINE
CAM
LINE
PB
MUTE
PB REC
A MUTE
Q403
Q405, 406
LEVEL SHIFT
AU IN/OUT
PB RF
REC AFM RF
VIDEO (2) (VS)
VIDEO (1) (VS)
CN401
AUDIO 4.9V (CN401 ⑫)
AUDIO FADER
1.5M DEV
AU FSC
IR ADJ
AU 4.9V (CN401 ⑫)
SS 4.9V (CN401 ⑦)
CN402
MIC IN
SIRCS VCC
SIRCS SIG
HP OUT
AUDIO I/O
SIRCS SIG
JOG
AU IN/OUT
CAM/LINE
VA PB MODE
SP/LP
A MUTE
SYSTEM CONTROL (VS)
RF SWP
SERVO (VS)
09
MA-197 BOARD (See Page 4-53)
IC003
MIC AMP
CN001
EXT VCC
VCC
MIC VCC
MIC AMP
MIC VCC
MIC SIG
J001
EXT/MIC
Q002
FILTER
CN003
MIC
M003
IC002
VCC
R OUT
SIRCS
VS-110 BOARD (See Page 4-34, 4-37)
CN202
CN504
CN201
DD-64 BOARD (See Page 4-69)
CN901
J903
EARPHONE
TERMINAL BOARD
J201
AUDIO

3-9. EVF BLOCK DIAGRAM


VF-44 BOARD (See Page 4-64)
SYSCON (VS) TALLY
VIDEO (1) (VS) EVF OUT
CN501
EVF 5V
D502 TALLY
D501 TALLY
IC501 ⑪ REC
IC501
AFC
H OSC
H DRIVE
SYNC SEP
VIDEO AMP/BLKG MIX
V SYNC SEP
V OSC
V OUT
VCC
VCC
EVF 5V
RV505
V SIZE
RV501
CONTRAST
Q501
VIDEO OUT
Q503
H OUT
EVF5V
HOLD DOWN
C504
H SIZE
SOL501
D503
DUMPER
T501
FBT
EVF 5V
RV501
FOCUS
RV502
FOCUS
RV503
BRIGHT
IC501 ⑬ REC
2.5Vp-p
1Vp-p
H
W502
G1
H
H
HV
G3
G2
CN503
DH1
DH2
EVF 5V
L503
HLC
CN502
DV2
DV1
V901
PICTURE TUBE
L901
DEFLECTION YOKE
H
V
09

3-10. POWER BLOCK DIAGRAM


MA BOARD
IC003/001
IC002
(See Page 4-53, 4-61)
IC401/1301
AU BOARD
(See Page 4-49, 4-57)
TERMINAL BOARD
DD BOARD (See Page 4-69)
J901 BATTERY TERMINAL
IC901
DC/DC CONVERTER
T901
EMERGENCY DETECT
DRUM/CAPSTAN PWM DRIVE
(See Page 4-25, 4-28, 4-31, 4-34, 4-37) VS BOARD
IC951
IC201, 203, IC205, 208
IC102
IC501
IC508
IC505
IC500
MODE CONTROL
IC502
IC506
IC507
VF-44 BOARD (See Page 4-64)
IC501
VC BOARD (See Page 4-11, 4-14, 4-17, 4-19)
IC603
IC704
IC702
IC701
IC751, IC752, IC755
IC753
IC754
IC602
IC601
IC610
IC611
IC609
IC614
IC613
IC604
IC703
IC705
IC777
IC776
IC772 IC775
FP-46 BOARD (See Page 4-8)
IC691
ZOOM LENS UNIT
FP-49 BOARD
(See Page 4-8)
SL-38 BOARD (See Page 4-45)
LS-33 BOARD (See Page 4-45)
IC001
CONTROL SWITCH BLOCK (FK)
CONTROL SWITCH BLOCK (CK)
ZB-2 BOARD (See Page 4-41)

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.

(In addition to this , the necessary note is printed in each block.)

- **For printed wiring boards.**
- ▨ : Pattern from the side which enables seeing.
  (The other layers'patterns are not indicated.)
- Circled numbers refer to waveforms.
- (B) or (F), etc. of capacitors indicate the temperature characteristics.
- ○: Through hole.

* Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

- **For schematic diagrams.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minuts side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4W unless otherwise noted.
  Chip resistor are 1/10W unless otherwise noted.
  kΩ : 1000Ω , MΩ : 1000kΩ .
- All capacitors are in μF unless otherwise noted. pF: μμF.
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ⊡ : nonflammable resistor.
- ∿ : fusible resistor.
- ▭ : panel designation.
- △ : internal component.
- ▭ : adjustment for repeair.
- —— : B+ Line.
- - - - : B– Line.
- ⇨ : IN/OUT direction of (+, –) B LINE.
- Circled numbers refer to waveforms.

Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safty. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

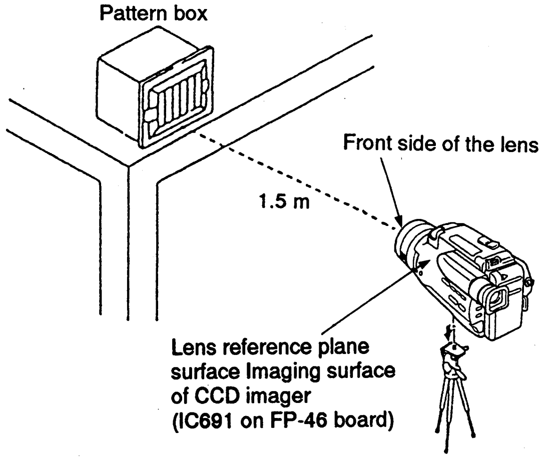
When indicating parts by reference number, please include the board name.

- **Measuring conditions voltage value and waveform.**

(CAMERA block)

- The object is color bar chart of pattern box.
- Voltages are dc between ground and measurement points.
  Readings are taken with a digital multimeter (DC 10MΩ).
- Voltage variations may be noted due to normal production tolerances.

1. Connection


Pattern box
Front side of the lens
1.5 m
Lens reference plane surface Imaging surface of CCD imager (IC691 on FP-46 board)

2. Adjust the distance so that the output waveform of Fig. a and the Fig. b can be obtain.

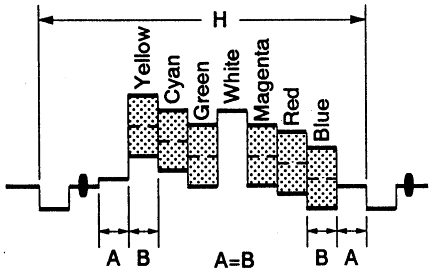


Fig. a (Video output terminal output waveform)

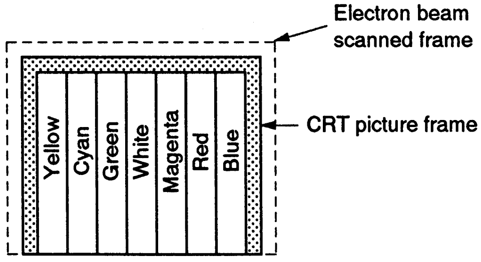


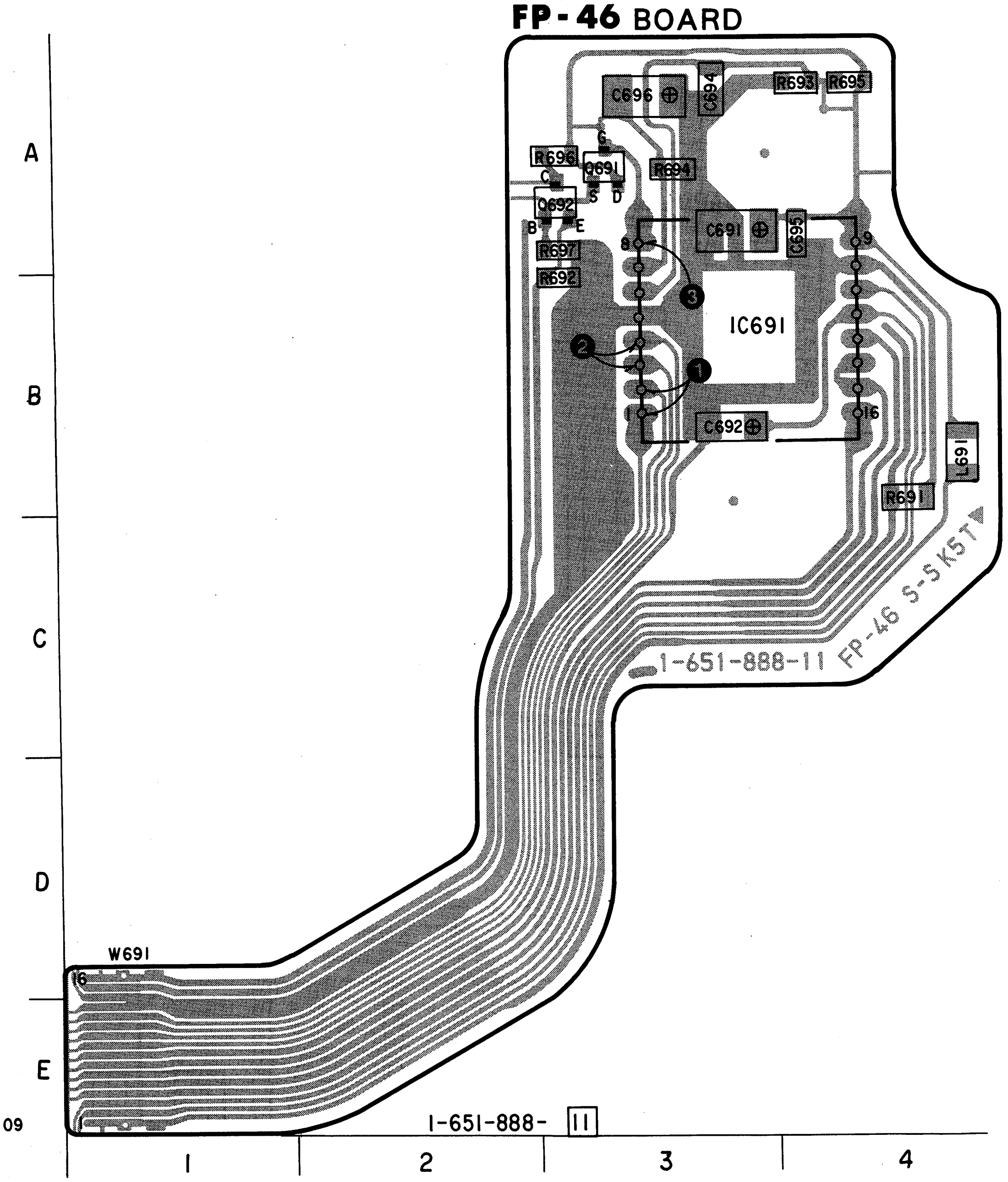
Fig. b (Picture on monitor TV)

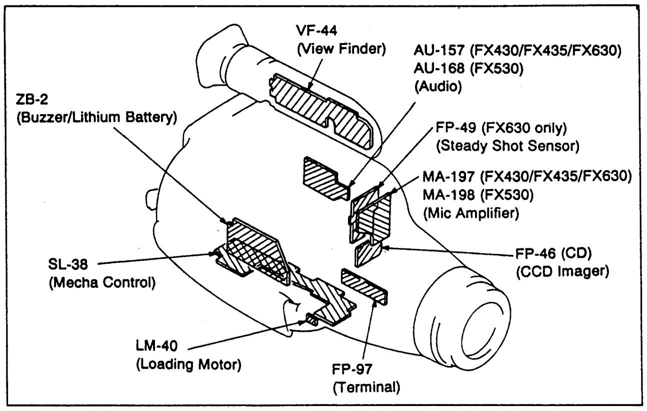
(VIDEO, SERVO/SYSTEM CONTROL, AUDIO, LCD CONTROL)

- Voltages are dc between ground and measurement points.
- Readings are taken with a color-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

FP-46 (CCD IMAGER) PRINTED WIRING BOARD

— Ref. No. FP-46 BOARD: 3000 series —


FP-46 BOARD
C696
C694
R693
R695
R696
G
Q691
S
D
R694
C
Q692
B
E
R697
R692
C691
C695
8
9
3
IC691
2
1
1
16
C692
L691
R691
1-651-888-11
FP-46 S-5K5T
W691
16
1
1-651-888- 11
09
A
B
C
D
E
1
2
3
4

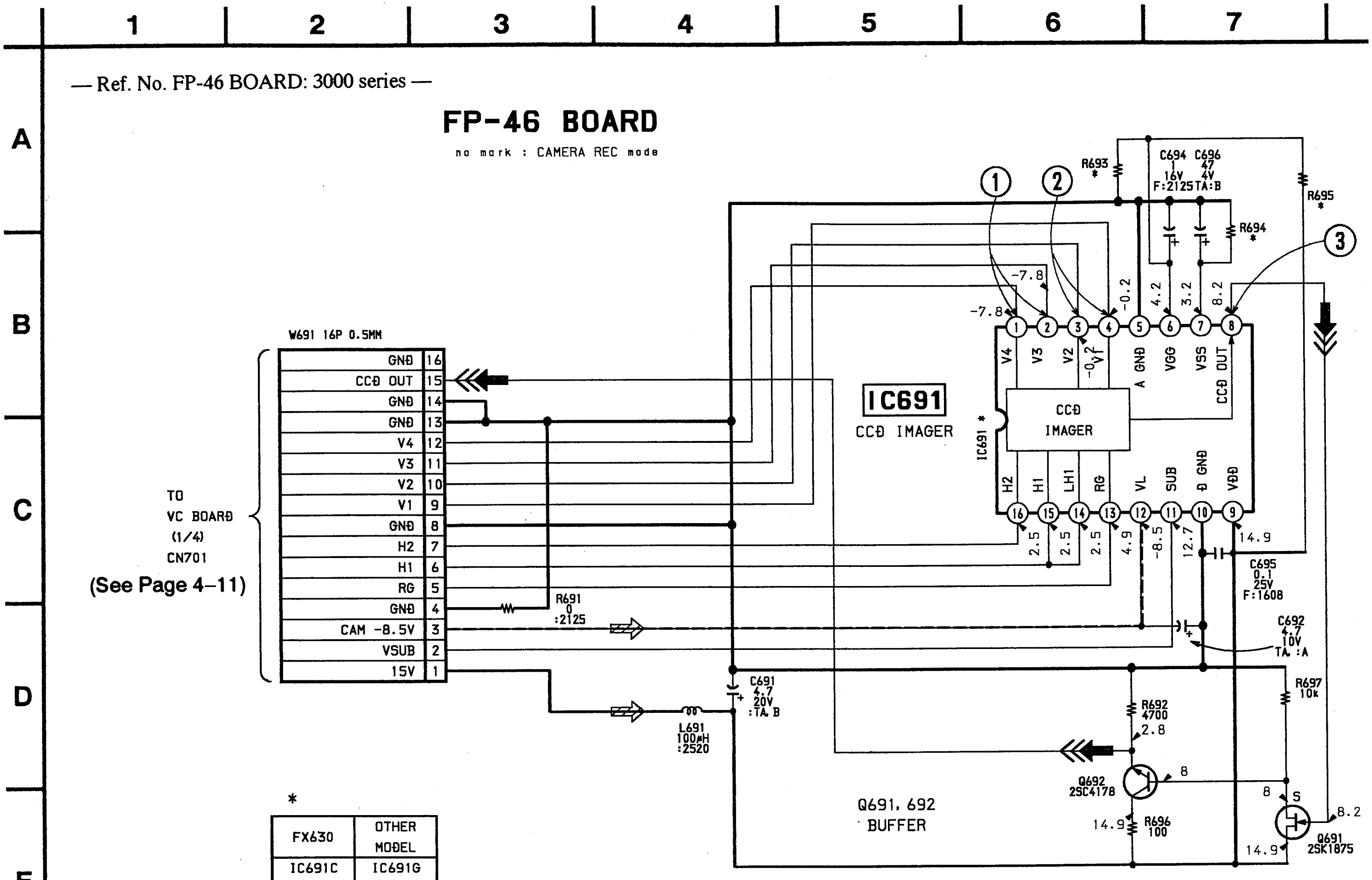

VF-44
(View Finder)
AU-157 (FX430/FX435/FX630)
AU-168 (FX530)
(Audio)
ZB-2
(Buzzer/Lithium Battery)
FP-49 (FX630 only)
(Steady Shot Sensor)
MA-197 (FX430/FX435/FX630)
MA-198 (FX530)
(Mic Amplifier)
FP-46 (CD)
(CCD Imager)
SL-38
(Mecha Control)
LM-40
(Loading Motor)
FP-97
(Terminal)

FP-46 (CCD IMAGER) SCHEMATIC DIAGRAM

— Ref. No. FP-46 BOARD: 3000 series —

FP-46 BOARD

no mark : CAMERA REC mode



1
2
3
4
5
6
7
A
B
C
D
E
W691 16P 0.5MM
GND 16
CCD OUT 15
GND 14
GND 13
V4 12
V3 11
V2 10
V1 9
GND 8
H2 7
H1 6
RG 5
GND 4
CAM -8.5V 3
VSUB 2
15V 1
TO
VC BOARD
(1/4)
CN701
(See Page 4-11)
R691
0
:2125
C691
4.7
20V
:TA B
L691
100µH
:2520
IC691
CCD IMAGER
IC691 *
CCD
IMAGER
V4
V3
V2
V1
A GND
VGG
VSS
CCD OUT
H2
H1
LH1
RG
VL
SUB
Φ GND
VDD
-7.8
-7.8
-0.2
-0.2
4.2
3.2
8.2
2.5
2.5
2.5
4.9
-8.5
12.7
14.9
R693
*
C694
1
16V
C696
47
4V
F:2125TA:B
R694
*
R695
*
C695
0.1
25V
F:1608
C692
4.7
10V
TA :A
R697
10k
R692
4700
2.8
Q692
2SC4178
8
8
S
8.2
14.9
R696
100
14.9
Q691
2SK1875
Q691, 692
BUFFER

*

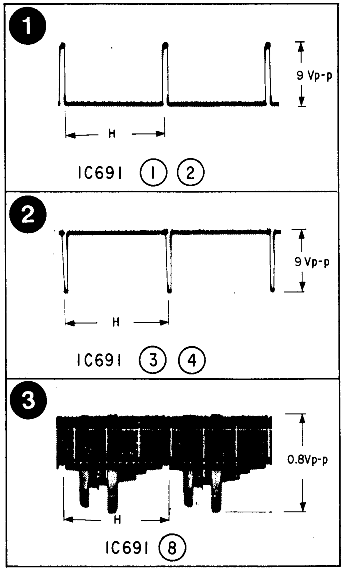
FX630	OTHER MODEL
IC691C ICX59AK-4	IC691G ICX054K-1
R693C 39k	R693G 33k
R694C 820	R694G 680
R695C 100k	R695G 220k

09

- **SIGNAL PATH**

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC			➡
PB			

FP-46BOARD

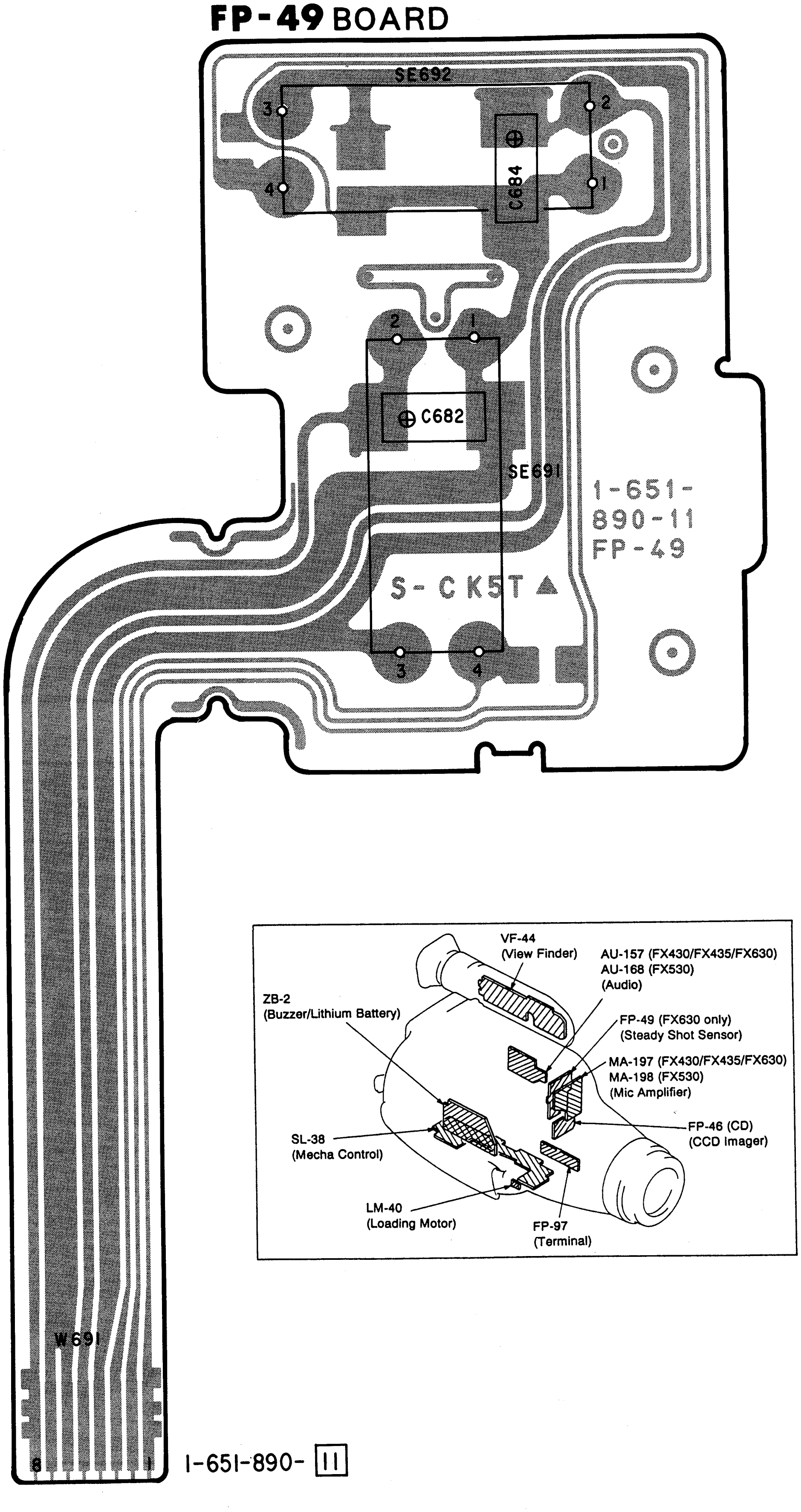


Note on the CCD Imager replacement

- Some of this units require the correction data by the CCD imager (IC691 on FP-46 board), some do not.
  The correction data is input in F page and addresses 1D to 2C of the camera micro processor (IC602 on VC board), and also written on the CCD data label put on the shield case (upper) of the DD board.
  The correction data is not required for the CCD imager supplied for repair. Therefore, when replacing the CCD imager to which the CCD data label is put, remove the CCD data label and input 00 to F page and addresses 1D to 2C of the camera micro processor. Refer to the camera adjustment for input method.
- The CCD imager is not mounted for the already mounted FP-46 board supplied as the repair parts.
  When replacing the FP-46 board, remove the CCD imager from the old board and install on the new board.
- Perform all adjustments of the camera block when the CCD imager has been replaced.
- Handle the CCD imager with attention such as MOS IC as it may be broken by static electricity in the structure.
  Also, prevent the receiving light section from dust attached and strong light.

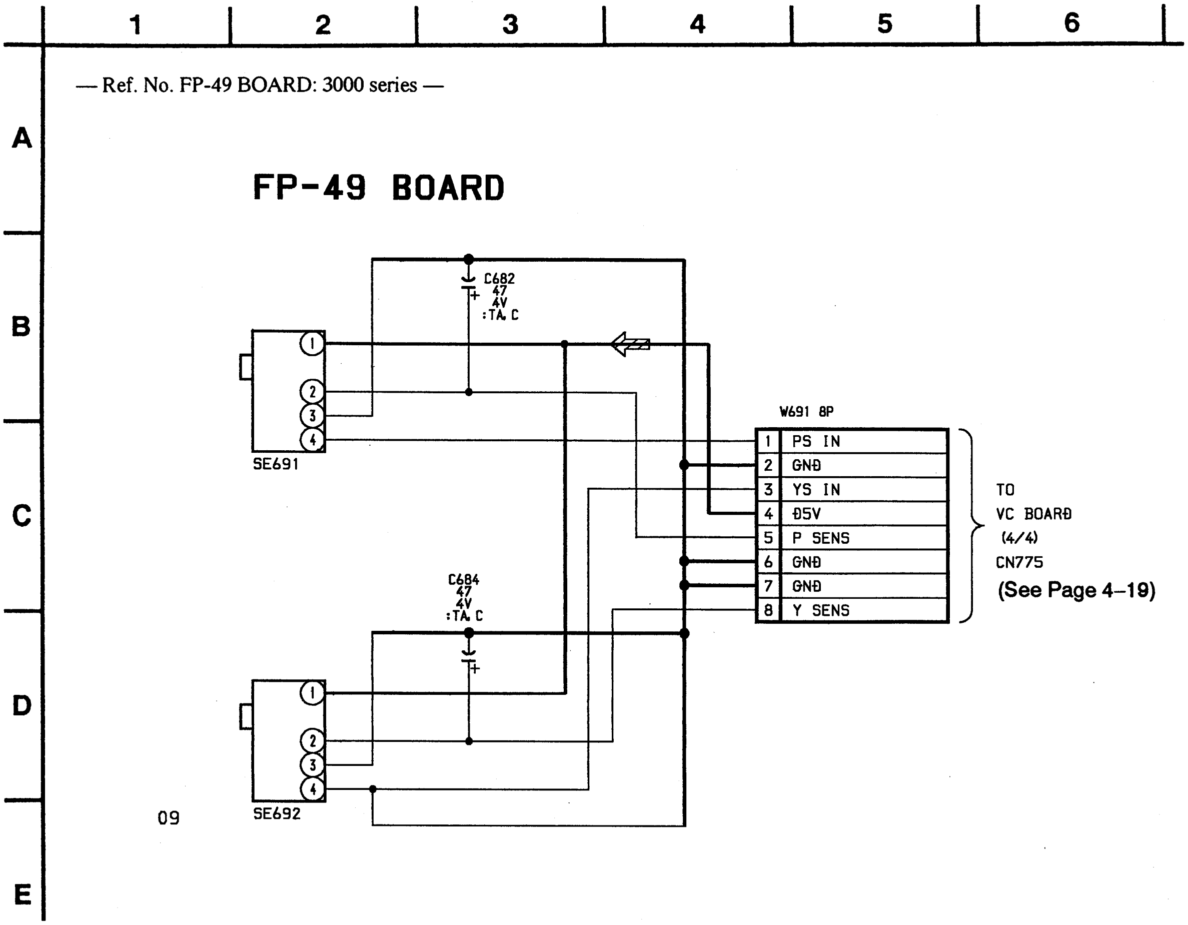
FP-49 (STEADY SHOT SENSOR) PRINTED WIRING BOARD (CCD-FX630)

— Ref. No. FP-49 BOARD: 3000 series —


FP-49 BOARD
SE692
3
2
4
1
C684
2
1
C682
SE691
1-651-890-11
FP-49
S-CK5T ▲
3
4
W691
8
1
1-651-890-11
VF-44
(View Finder)
AU-157 (FX430/FX435/FX630)
AU-168 (FX530)
(Audio)
ZB-2
(Buzzer/Lithium Battery)
FP-49 (FX630 only)
(Steady Shot Sensor)
MA-197 (FX430/FX435/FX630)
MA-198 (FX530)
(Mic Amplifier)
FP-46 (CD)
(CCD Imager)
SL-38
(Mecha Control)
LM-40
(Loading Motor)
FP-97
(Terminal)

09

FP-49 (STEADY SHOT SENSOR) SCHEMATIC DIAGRAM (CCD-FX630)

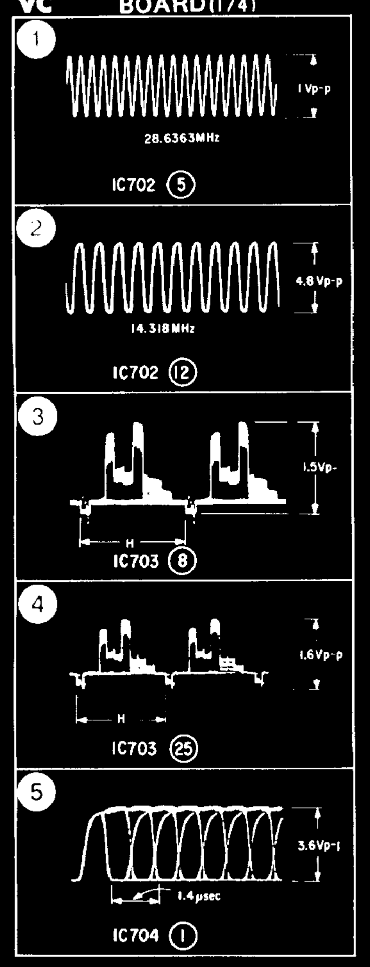

— Ref. No. FP-49 BOARD: 3000 series —

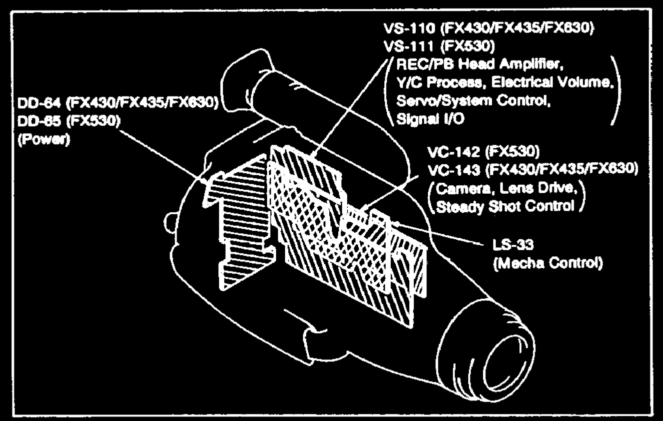
1
2
3
4
5
6
A
B
C
D
E
FP-49 BOARD
C682
47
4V
:TA C
SE691
W691 8P
1 PS IN
2 GND
3 YS IN
4 D5V
5 P SENS
6 GND
7 GND
8 Y SENS
TO
VC BOARD
(4/4)
CN775
(See Page 4-19)
C684
47
4V
:TA C
SE692
09

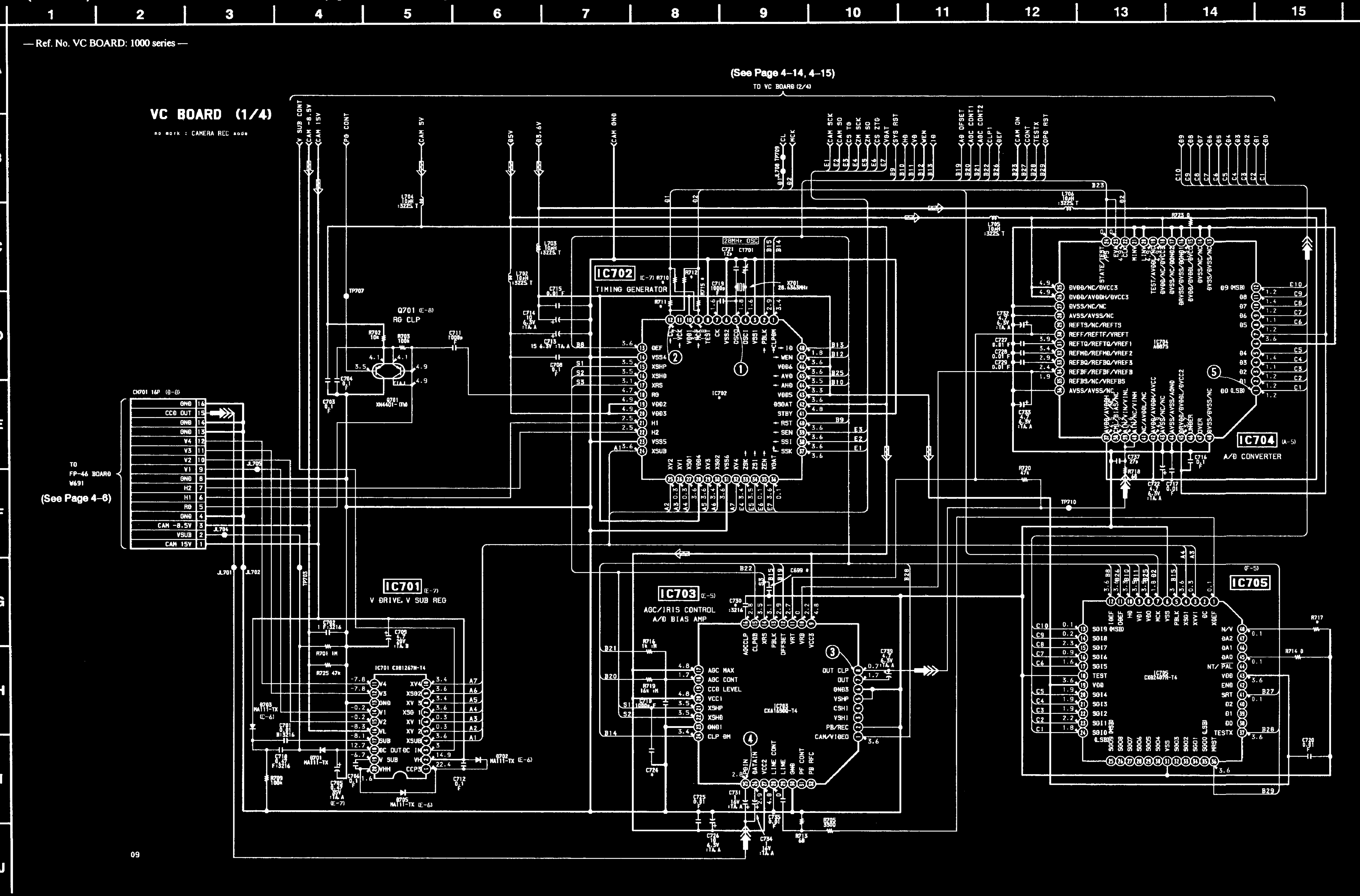
VC (CAMERA) SCHEMATIC DIAGRAM

- Refer to page 4–9 for Printed Wiring Board.

— Ref. No. VC BOARD: 1000 series —




VS-110 (FX430/FX435/FX630)
VS-111 (FX530)
(REC/PB Head Amplifier, Y/C Process, Electrical Volume, Servo/System Control, Signal I/O)
DD-64 (FX430/FX435/FX630)
DD-65 (FX530)
(Power)
VC-142 (FX530)
VC-143 (FX430/FX435/FX630)
(Camera, Lens Drive, Steady Shot Control)
LS-33
(Mecha Control)


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
A
B
C
D
E
F
G
H
I
J
VC BOARD (1/4)
no mark : CAMERA REC mode
(See Page 4–14, 4–15)
TO VC BOARD (2/4)
TO
FP-46 BOARD
W691
(See Page 4–6)
IC701
V DRIVE, V SUB REG
IC702
TIMING GENERATOR
IC703
AGC/IRIS CONTROL
A/D BIAS AMP
IC704
A/D CONVERTER
IC705
Q701
RG CLP
09

C

C699C 120p	C699G XX	C699K XX	C699L XX
C724C 47p	C724G XX	C724K XX	C724L XX
C730C 0.1 B:3216	C730G 0.15 B:3216	C730K 0.15 B:3216	C730L 0.15 B:3216

IC

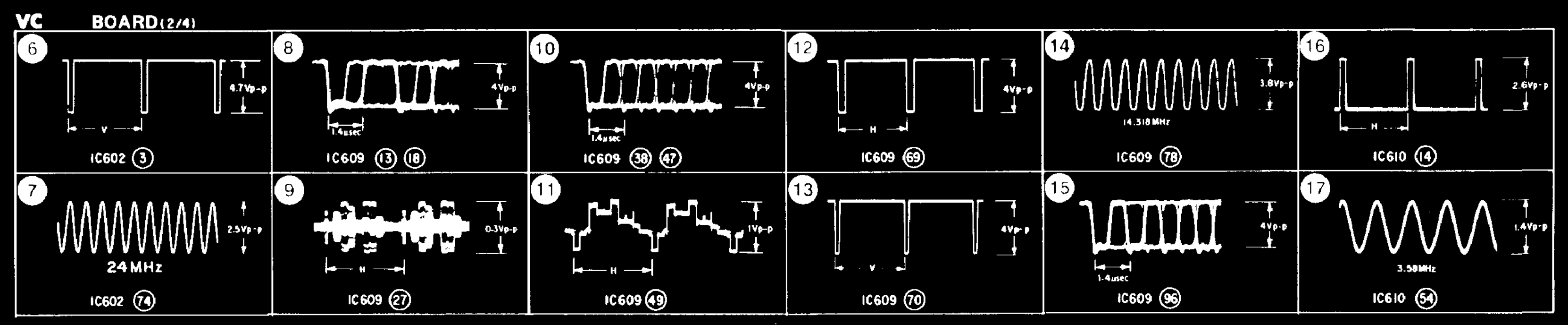
FX630	FX530	FX430	FX435
IC702C CXD2405R-T4	IC702G CXD1266R-T4	IC702K CXD1266R-T4	IC702L CXD1266R-T4

R

FX630	FX530	FX430	FX435
R710C XX	R710G 0	R710K 0	R710L 0
R711C 0	R711G XX	R711K XX	R711L XX
R712C XX	R712G 0	R712K 0	R712L 0
R715C 0	R715G XX	R715K XX	R715L XX
R717C 0	R717G XX	R717K XX	R717L XX

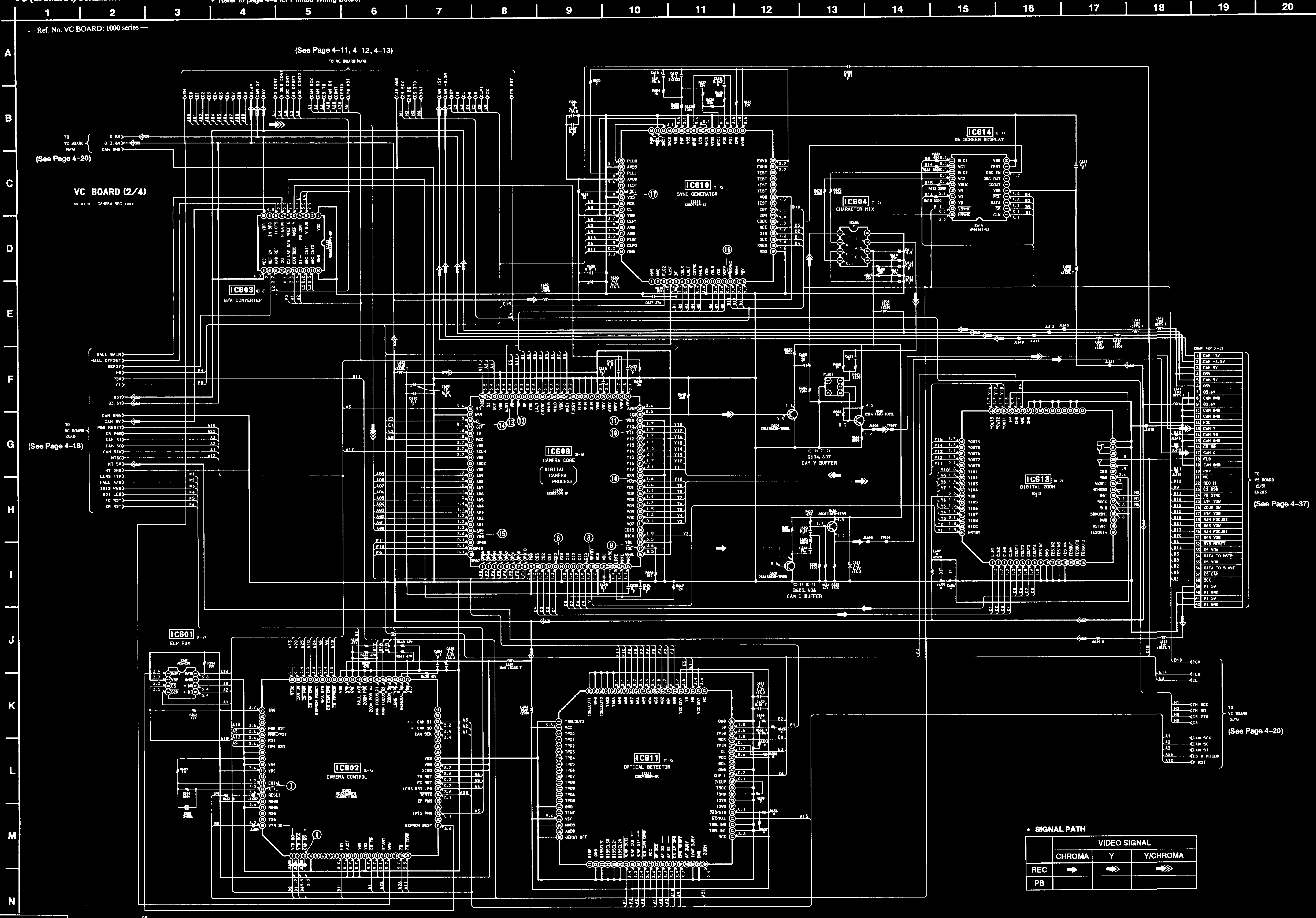
- SIGNAL PATH

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC			➡≫
PB			



VC (CAMERA) SCHEMATIC DIAGRAM

- Refer to page 4–9 for Printed Wiring Board.


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
A
B
C
D
E
F
G
H
I
J
K
L
M
N
— Ref. No. VC BOARD: 1000 series —
(See Page 4–11, 4–12, 4–13)
TO VC BOARD (1/4)
TO VC BOARD (4/4)
(See Page 4–20)
VC BOARD (2/4)
IC603 D/A CONVERTER
IC610 SYNC GENERATOR
IC614 ON SCREEN DISPLAY
IC604 CHARACTER MIX
IC609 CAMERA CORE DIGITAL CAMERA PROCESS
IC613 DIGITAL ZOOM
Q604, 607 CAM Y BUFFER
Q605, 606 CAM C BUFFER
TO VC BOARD (3/4)
(See Page 4–18)
TO VS BOARD (5/5) CN205
(See Page 4–37)
IC601 EEP ROM
IC602 CAMERA CONTROL
IC611 OPTICAL DETECTOR
TO VC BOARD (4/4)
(See Page 4–20)

C

FX630	FX530	FX430	FX435
C633C 27p	C633G 33p	C633K 33p	C633L 33p
C635C 10 6.3V :TA A	C635G XX	C635K XX	C635L XX
C636C 0.1 F	C636G XX	C636K XX	C636L XX

IC

FX630	FX530	FX430	FX435
IC601C AK6420F-E1	IC601G AK6420F-E1	IC601K AK6420F-E1	IC601L AK6420F-E1
IC604C NJM2235M (TE1)	IC604G XX	IC604K XX	IC604L XX
IC611C CXD2133BR-T6	IC611G CXD2133BR-T6	IC611K CXD2133BR-T6	IC611L CXD2133BR-T6
IC613C CXD2152REL	IC613G XX	IC613K XX	IC613L XX
IC609C CXD2150R-T6	IC609G CXD2150R-T6	IC609K CXD2150R-T6	IC609L CXD2150R-T6

L

L607C 10μH :2520	L607G XX	L607K XX	L607L XX

R

FX630	FX530	FX430	FX435
R616C 0	R616G XX	R616K XX	R616L XX
R624C XX	R624G 0	R624K 0	R624L 0
R653C XX	R653G 0	R653K 0	R653L 0
R654C 0	R654G XX	R654K XX	R654L XX
R656C XX	R656G 0	R656K 0	R656L 0
R657C 0	R657G XX	R657K XX	R657L XX

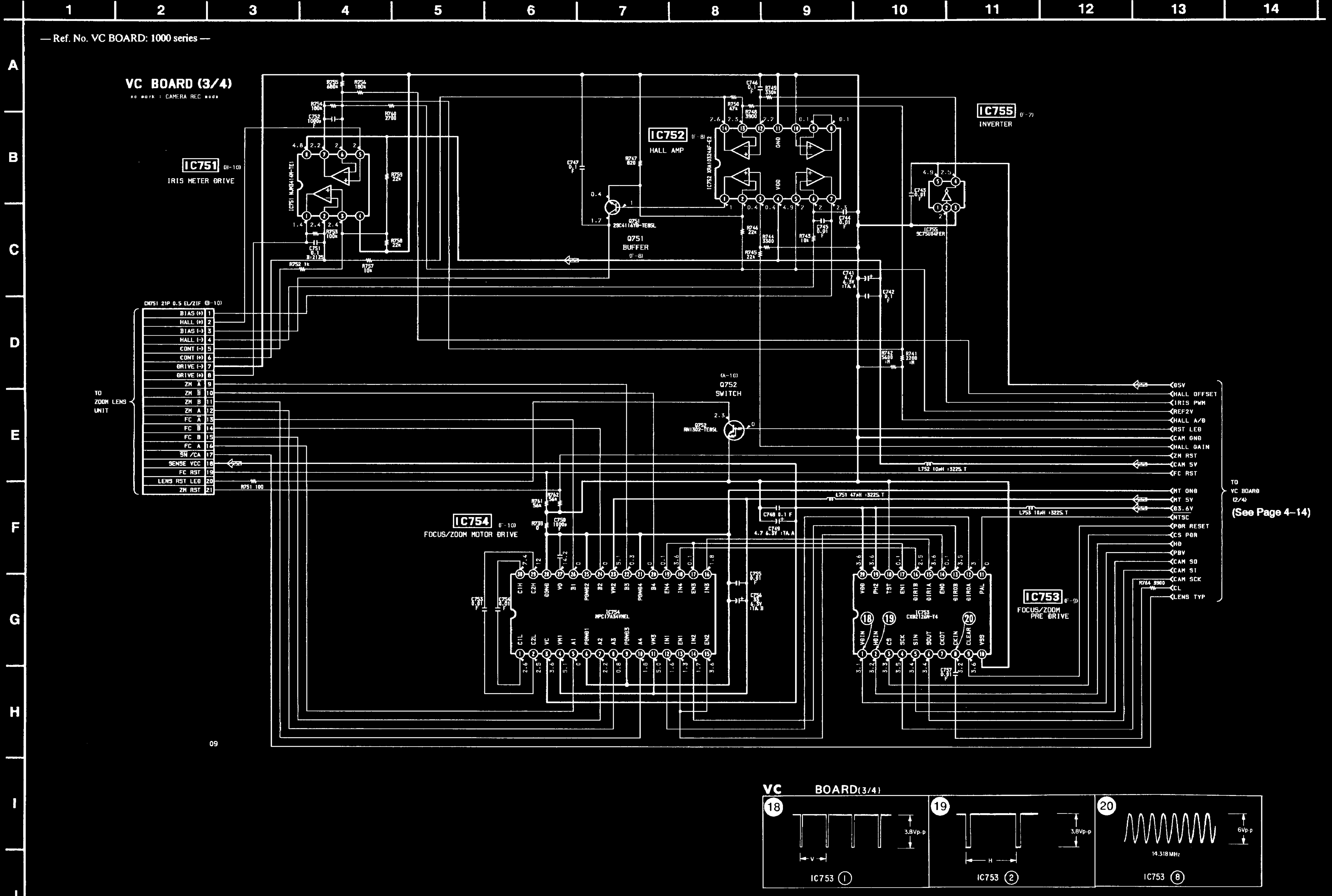
- SIGNAL PATH

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC	➡	⇛	⇛
PB			

VC (LENS DRIVE) SCHEMATIC DIAGRAM

• Refer to page 4-9 for Printed Wiring Board.

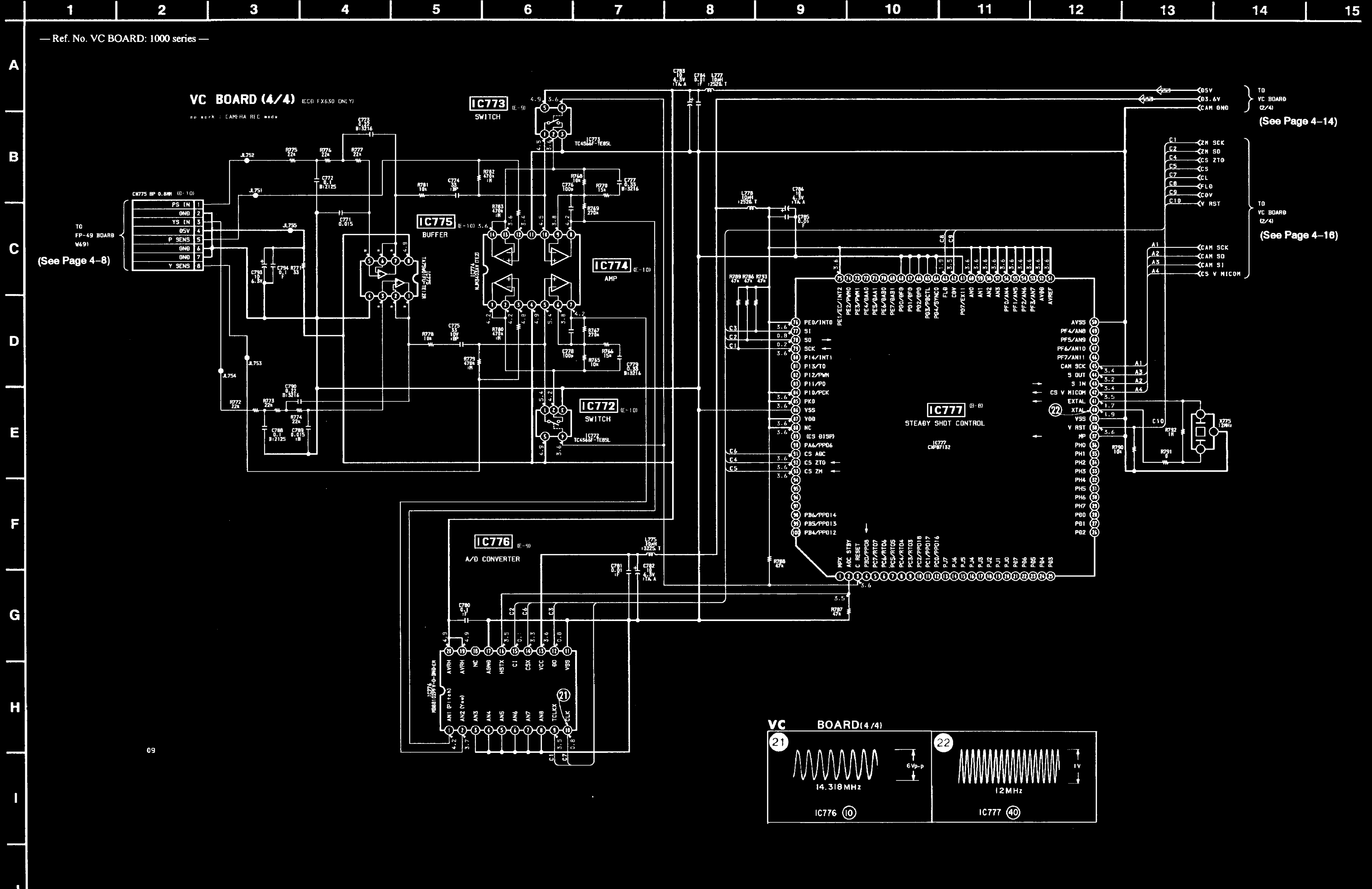
— Ref. No. VC BOARD: 1000 series —


VC BOARD (3/4)
IC751 IRIS METER DRIVE
IC752 HALL AMP
IC755 INVERTER
Q751 BUFFER
Q752 SWITCH
IC754 FOCUS/ZOOM MOTOR DRIVE
IC753 FOCUS/ZOOM PRE DRIVE
TO ZOOM LENS UNIT
TO VC BOARD (2/4)
(See Page 4-14)
HALL OFFSET
IRIS PWM
HALL A/D
CAM GND
HALL GAIN
ZM RST
CAM 5V
FC RST
MT GND
MT 5V
NTSC
CAM SO
CAM SI
CAM SCK
LENS TYP
VC BOARD(3/4)
18
19
20
3.8Vp-p
6Vp-p
14.318MHz
IC753 ①
IC753 ②
IC753 ⑧

VC (STEADY SHOT CONTROL) SCHEMATIC DIAGRAM (CCD-FX630)

• Refer to page 4-9 for Printed Wiring Board.

— Ref. No. VC BOARD: 1000 series —


VC BOARD (4/4)
IC773 SWITCH
IC775 BUFFER
IC774 AMP
IC772 SWITCH
IC777 STEADY SHOT CONTROL
IC776 A/D CONVERTER
TO FP-49 BOARD
(See Page 4-8)
PS IN
YS IN
GND
P SENS
Y SENS
TO VC BOARD (2/4)
(See Page 4-14)
TO VC BOARD (2/4)
(See Page 4-16)
VC BOARD(4/4)
21
22
14.318MHz
12MHz
IC776 ⑩
IC777 ㊵

VS (REC/PB HEAD AMPLIFIER, Y/C PROCESS, ELECTRIC VOLUME, SERVO/SYSTEM CONTROL, SIGNAL I/O) PRINTED WIRING BOARD

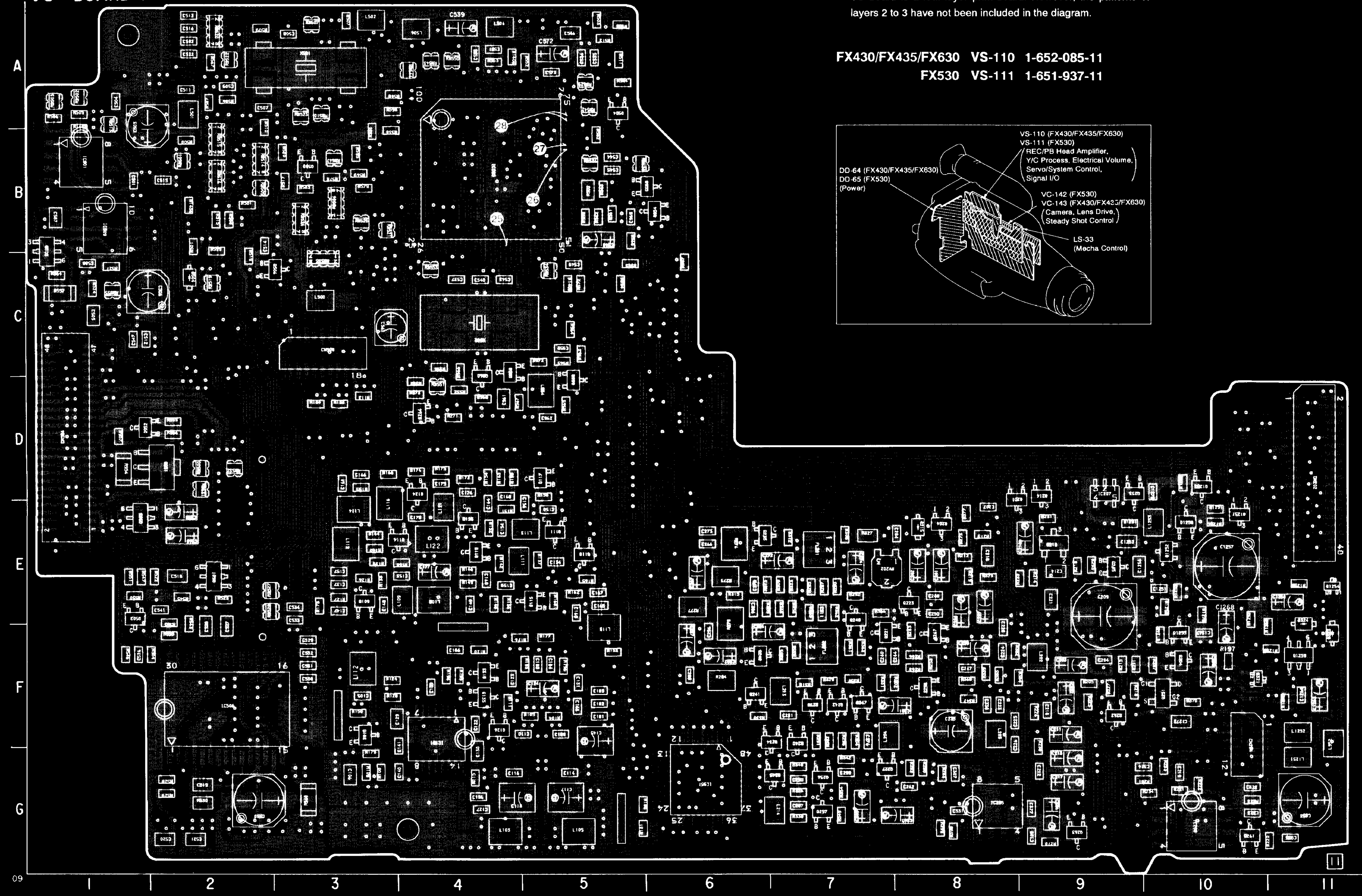
— Ref. No. VS BOARD: 2000 series —

- **For printed wiring boards.**
- VS board is a four-layer print board. However, the patterns of layers 2 to 3 have not been included in the diagram.

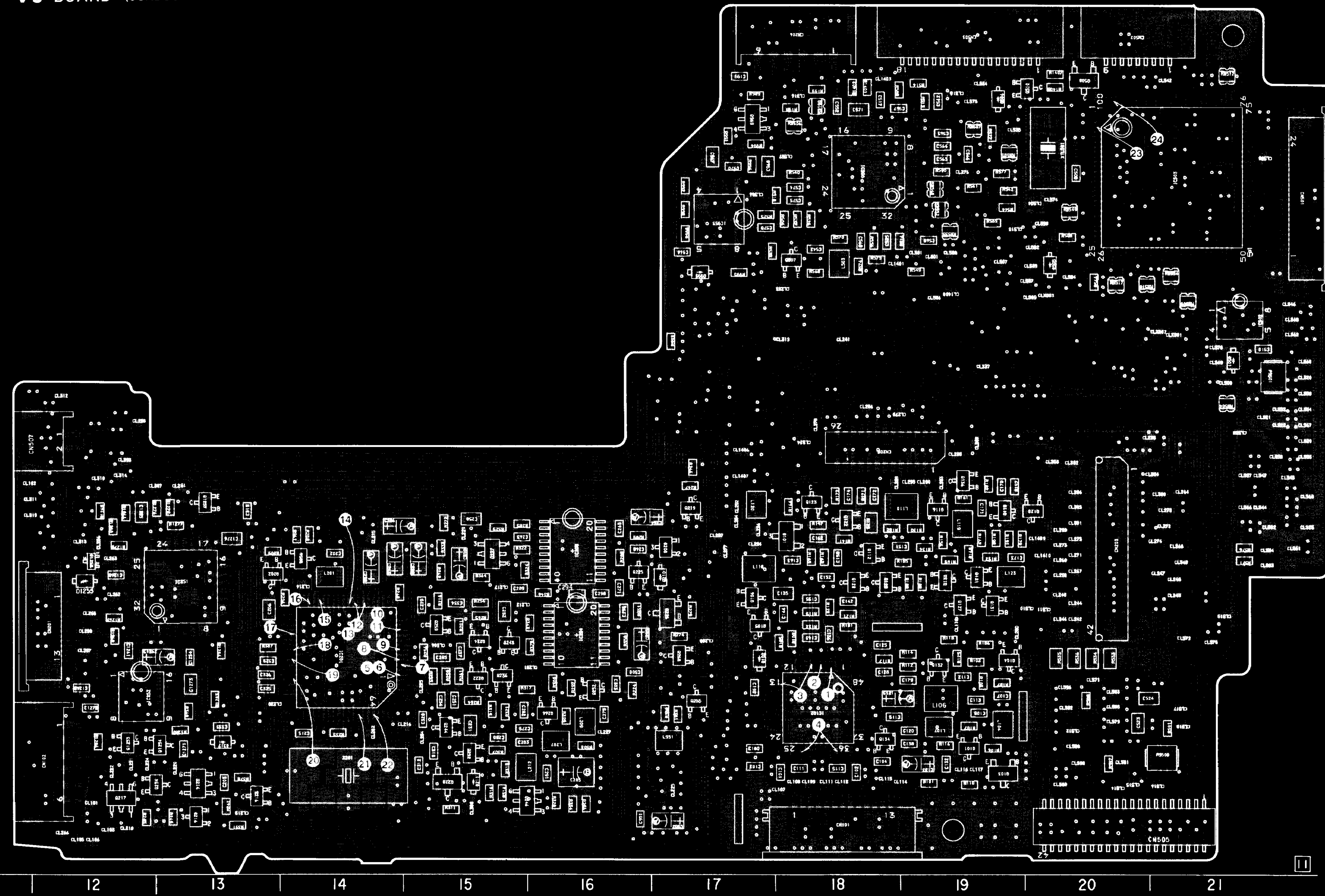
FX430/FX435/FX630	VS-110	1-652-085-11
FX530	VS-111	1-651-937-11

VS-110 (FX430/FX435/FX630)
VS-111 (FX530)
(REC/PB Head Amplifier, Y/C Process, Electrical Volume, Servo/System Control, Signal I/O)
DD-64 (FX430/FX435/FX630)
DD-65 (FX530)
(Power)
VC-142 (FX530)
VC-143 (FX430/FX435/FX630)
(Camera, Lens Drive, Steady Shot Control)
LS-33
(Mecha Control)

VS BOARD (COMPONENT SIDE)


A
B
C
D
E
F
G
1
2
3
4
5
6
7
8
9
10
11

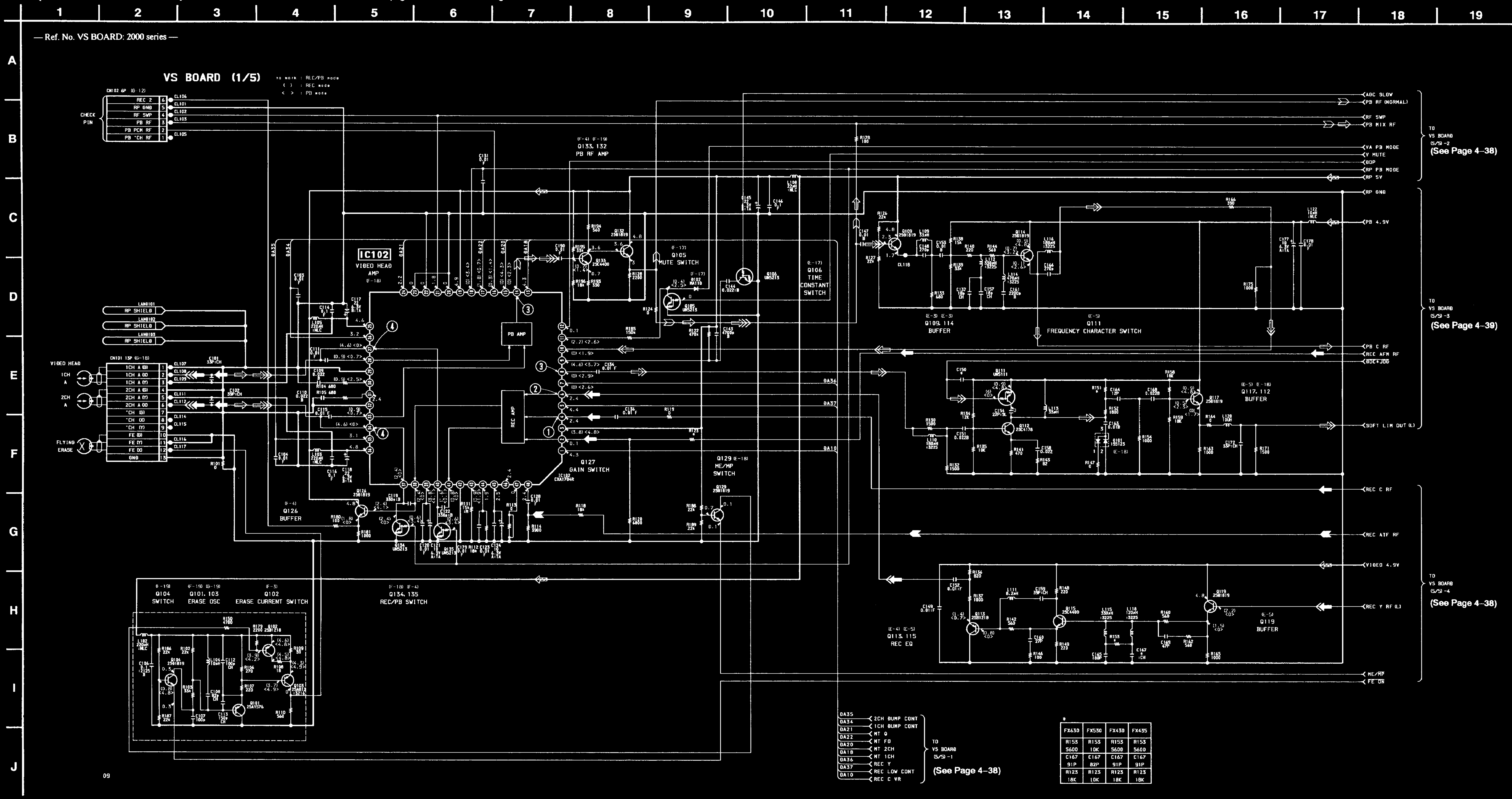
VS BOARD (CONDUCTOR SIDE)


12
13
14
15
16
17
18
19
20
21

VS (REC/PB HEAD AMPLIFIER) SCHEMATIC DIAGRAM

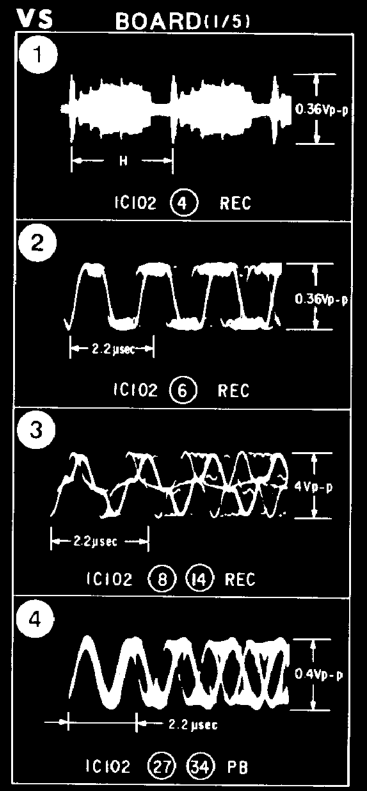
- Refer to page 4–21 for Printed Wiring Board.

— Ref. No. VS BOARD: 2000 series —


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
A
B
C
D
E
F
G
H
I
J
VS BOARD (1/5)
no mark : REC/PB mode
( ) : REC mode
< > : PB mode
CN102 6P (G-12)
CHECK PIN
REC 2
RP GND
RF SWP
PB RF
PB PCM RF
PB 'CH RF
CL106
CL101
CL102
CL103
CL105
RP SHIELD
VIDEO HEAD
1CH
2CH
FLYING ERASE
CN101 13P
IC102
VIDEO HEAD AMP
PB AMP
REC AMP
Q133, 132
PB RF AMP
Q105
MUTE SWITCH
Q106
TIME CONSTANT SWITCH
Q109, 114
BUFFER
Q111
FREQUENCY CHARACTER SWITCH
Q117, 112
BUFFER
Q127
GAIN SWITCH
Q129
ME/MP SWITCH
Q126
BUFFER
Q134, 135
REC/PB SWITCH
Q104
SWITCH
Q101, 103
ERASE OSC
Q102
ERASE CURRENT SWITCH
Q113, 115
REC EQ
Q119
BUFFER
AGC SLOW
PB RF (NORMAL)
RF SWP
PB MIX RF
VA PB MODE
V MUTE
DOP
RP PB MODE
RP 5V
TO
VS BOARD
(5/5) -2
(See Page 4–38)
RP GND
PB 4.9V
PB C RF
REC AFM RF
DOC+JOG
SOFT LIM OUT (L)
TO
VS BOARD
(5/5) -3
(See Page 4–39)
REC C RF
REC ATF RF
VIDEO 4.9V
REC Y RF (L)
ME/MP
FE ON
TO
VS BOARD
(5/5) -4
(See Page 4–38)
DA35
DA34
DA21
DA22
DA20
DA18
DA36
DA37
DA10
2CH BUMP CONT
1CH BUMP CONT
MT Q
MT FO
MT 2CH
MT 1CH
REC Y
REC LOW CONT
REC C VR
TO
VS BOARD
(5/5) -1
(See Page 4–38)
09

*

FX630	FX530	FX430	FX435
R153 5600	R153 10K	R153 5600	R153 5600
C167 91P	C167 82P	C167 91P	C167 91P
R123 18K	R123 10K	R123 18K	R123 18K



- SIGNAL PATH

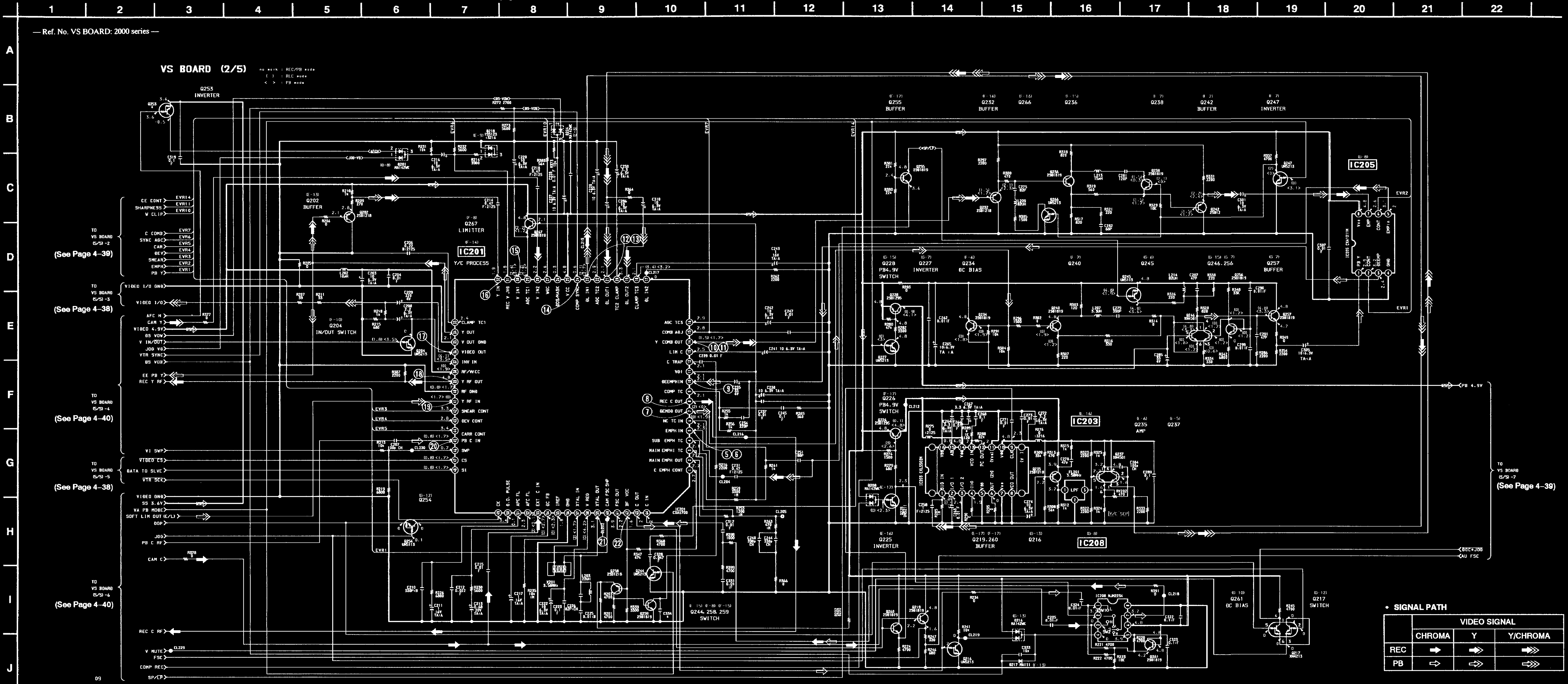
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡⋙	➡
PB	⇨	⇨»	⇨⋙	⇨

	REC	REC/PB	PB
Ref. signal	➤		▷

VS (Y/C PROCESS) SCHEMATIC DIAGRAM

- Refer to page 4-21 for Printed Wiring Board.
- Refer to page 4-31 for Waveforms.

— Ref. No. VS BOARD: 2000 series —



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A
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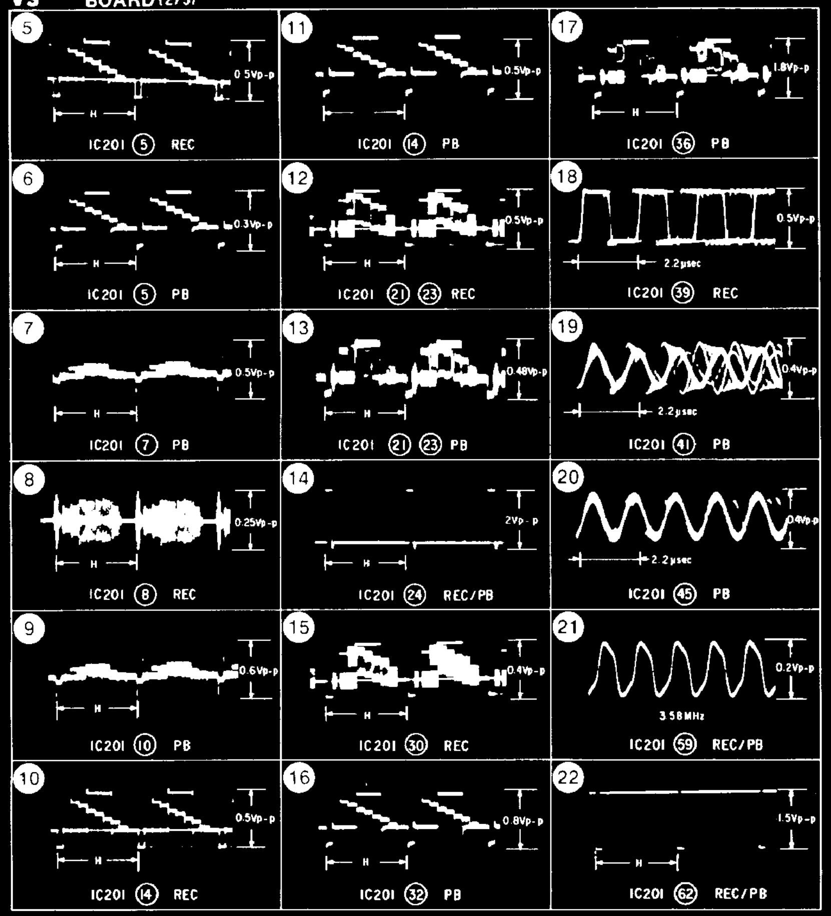
C
D
E
F
G
H
I
J
VS BOARD (2/5)
Q253 INVERTER
Q202 BUFFER
Q267 LIMITTER
IC201 Y/C PROCESS
Q204 IN/OUT SWITCH
Q254
Q255 BUFFER
Q232 BUFFER
Q266
Q236
Q238
Q242 BUFFER
Q247 INVERTER
IC205
Q228 PB4.9V SWITCH
Q227 INVERTER
Q234 DC BIAS
Q240
Q245
Q246, 256
Q257 BUFFER
Q226 PB4.9V SWITCH
IC203
Q235 AMP
Q237
Q225 INVERTER
Q219, 260 BUFFER
Q216
IC208
Q244, 258, 259 SWITCH
Q261 DC BIAS
Q217 SWITCH
TO VS BOARD (5/5)-2 (See Page 4-39)
CE CONT
SHARPNESS
W CLIP
C COMB
SYNC AGC
CAR
DEV
SMEAR
EMPH
PB Y
TO VS BOARD (5/5)-3 (See Page 4-38)
VIDEO I/O GND
VIDEO I/O
TO VS BOARD (5/5)-4 (See Page 4-40)
AFC H
CAM Y
VIDEO 4.9V
8S VDW
Y IN/OUT
J08 VB
VTR SYNC
8S VDB
EE PB Y
REC Y RF
TO VS BOARD (5/5)-5 (See Page 4-38)
VI SYNC
VIDEO CS
DATA TO SLVE
VTR SCK
VIDEO GND
5S 3.6V
VA PB MODE
SOFT LIM OUT (C/L)
DOP
JOG
PB C RF
CAM C
TO VS BOARD (5/5)-6 (See Page 4-40)
REC C RF
V MUTE
FSC
COMP REC
SP/LP
TO VS BOARD (5/5)-7 (See Page 4-39)
PB 4.9V
BOC+JOB
AU FSC

• SIGNAL PATH

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC	➡	⇒	⇛
PB	⇨	⇨	⇨

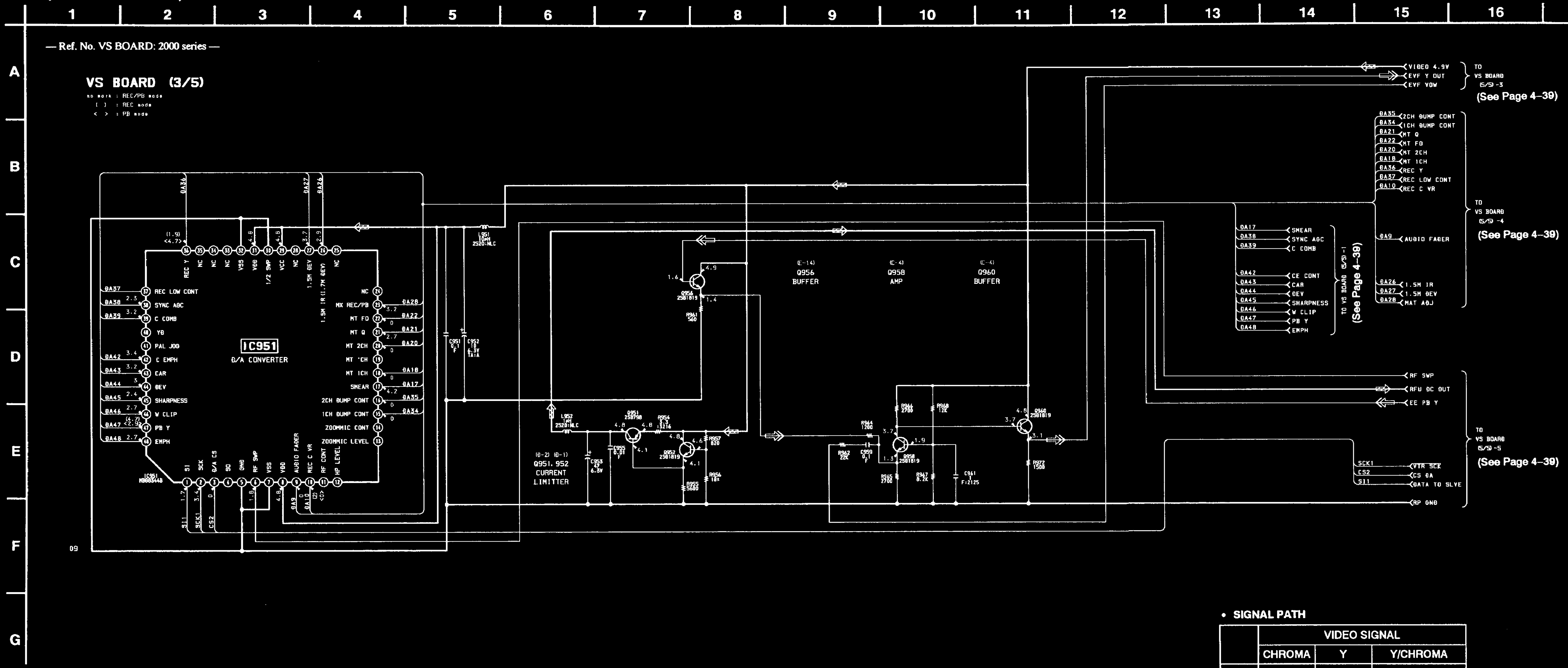
VIDEO

VS BOARD (2/5)



VS (ELECTRIC VOLUME) SCHEMATIC DIAGRAM

- Refer to page 4–21 for Printed Wiring Board.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A
B
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D
E
F
G
— Ref. No. VS BOARD: 2000 series —
VS BOARD (3/5)
no mark : REC/PB mode
( ) : REC mode
< > : PB mode
IC951
D/A CONVERTER
IC951 MB88344B
REC LOW CONT
SYNC AGC
C COMB
YD
PAL JOG
C EMPH
CAR
DEV
SHARPNESS
W CLIP
PB Y
EMPH
REC Y
NC
VSS
VDD
1/2 SWP
VCC
1.5M DEV
1.5M IR (1.7M DEV)
MX REC/PB
MT FD
MT Q
MT 2CH
MT 1CH
SMEAR
2CH DUMP CONT
1CH DUMP CONT
ZOOMMIC CONT
ZOOMMIC LEVEL
SI
SCK
D/A CS
SO
GND
RF SWP
AUDIO FADER
REC C VR
RF CONT
HP LEVEL
SI1
SCK1
CS2
L951 10μH 2520:NLC
C951 0.1 F
C952 10 6.3V TA:A
L952 1μH 2520:NLC
C953 47 6.3V
C955 0.01 F
Q951 2SB798
Q952 2SD1819
R954 3.3 :3216
R955 5600
R956 18k
R957 820
(D-2) (D-1) Q951, 952 CURRENT LIMITTER
Q956 2SD1819
R961 560
(E-14) Q956 BUFFER
(C-4) Q958 AMP
(C-4) Q960 BUFFER
R964 1200
R962 22K
C959 0.1 F
Q958 2SD1819
R965 2700
R966 2700
R967 8.2K
R968 12K
C961 1 F:2125
Q960 2SD1819
R972 1500
DA17 SMEAR
DA38 SYNC AGC
DA39 C COMB
DA42 CE CONT
DA43 CAR
DA44 DEV
DA45 SHARPNESS
DA46 W CLIP
DA47 PB Y
DA48 EMPH
TO VS BOARD (5/5) -1 (See Page 4–39)
VIDEO 4.9V
EVF Y OUT
EVF VOW
TO VS BOARD (5/5) -3 (See Page 4–39)
DA35 2CH DUMP CONT
DA34 1CH DUMP CONT
DA21 MT Q
DA22 MT FD
DA20 MT 2CH
DA18 MT 1CH
DA36 REC Y
DA37 REC LOW CONT
DA10 REC C VR
DA9 AUDIO FADER
DA26 1.5M IR
DA27 1.5M DEV
DA28 MAT ADJ
TO VS BOARD (5/5) -4 (See Page 4–39)
RF SWP
RFU DC OUT
EE PB Y
SCK1 VTR SCK
CS2 CS DA
SI1 DATA TO SLVE
RP GND
TO VS BOARD (5/5) -5 (See Page 4–39)
09

- SIGNAL PATH

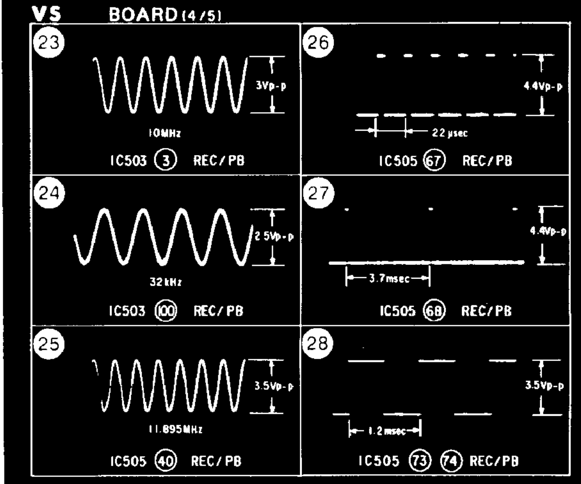
	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC			
PB		⇨	

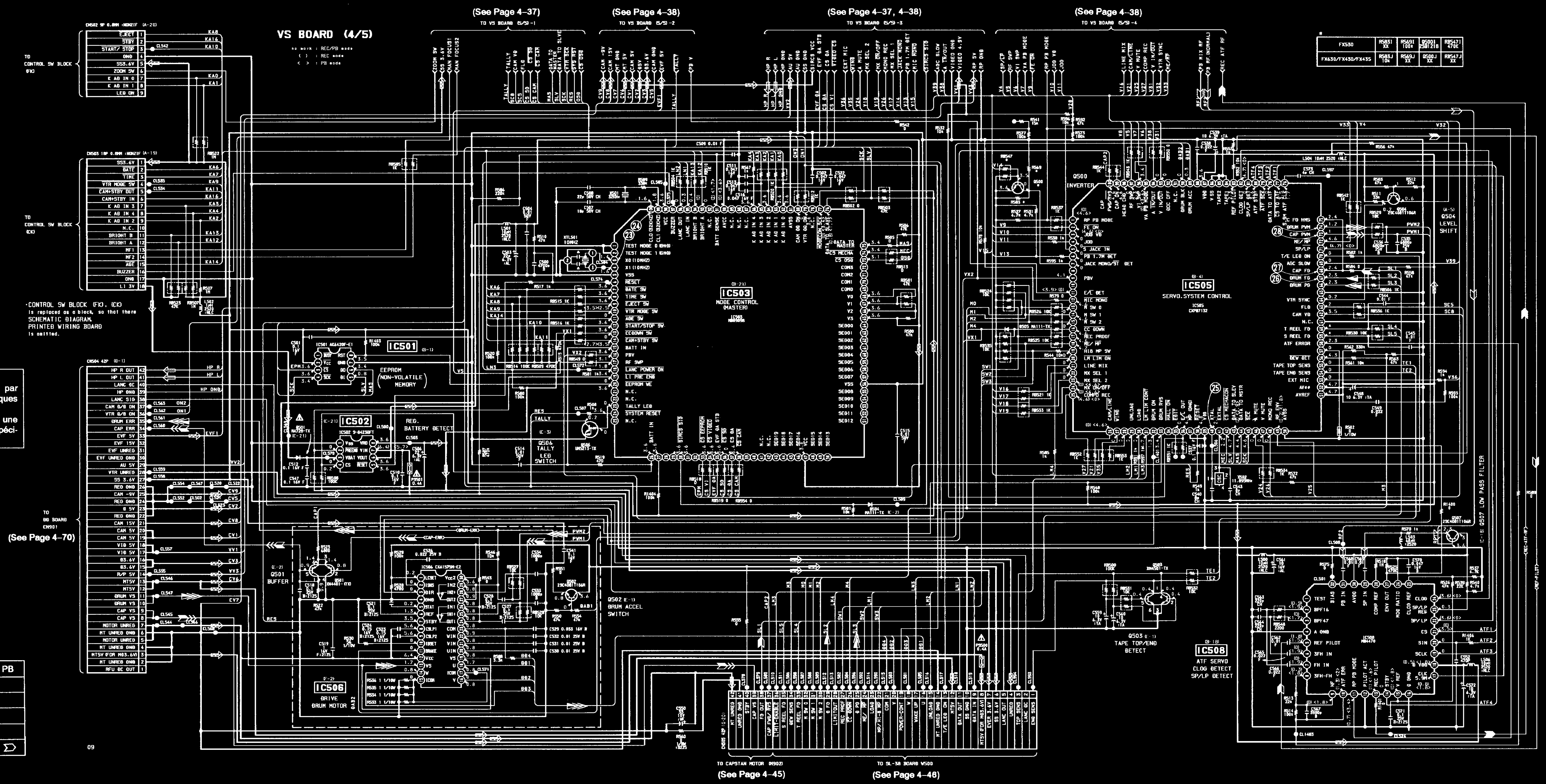
CCD-FX430/FX435/FX530/FX630

VS (SERVO/SYSTEM CONTROL) SCHEMATIC DIAGRAM

• Refer to page 4–21 for Printed Wiring Board.

— Ref. No. VS BOARD: 2000 series —





VS BOARD (4/5)
: REC/PB mode
( ) : REC mode
< > : PB mode
TO CONTROL SW BLOCK (FK)
TO CONTROL SW BLOCK (CK)
·CONTROL SW BLOCK (FK), (CK) is replaced as a block, so that there SCHEMATIC DIAGRAM, PRINTED WIRING BOARD is omitted.
TO DD BOARD CN901
(See Page 4–70)
(See Page 4–37)
TO VS BOARD (5/5)-1
(See Page 4–38)
TO VS BOARD (5/5)-2
(See Page 4–37, 4–38)
TO VS BOARD (5/5)-3
(See Page 4–38)
TO VS BOARD (5/5)-4
IC501 EEPROM (NON-VOLATILE MEMORY)
IC502 REG. BATTERY DETECT
IC503 MODE CONTROL (MASTER)
IC505 SERVO.SYSTEM CONTROL
IC506 DRIVE DRUM MOTOR
IC508 ATF SERVO CLOG DETECT SP/LP DETECT
Q500 INVERTER
Q501 BUFFER
Q502 DRUM ACCEL SWITCH
Q503 TAPE TOP/END DETECT
Q504 LEVEL SHIFT
Q506 TALLY LED SWITCH
Q507 LOW PASS FILTER
TO CAPSTAN MOTOR (M902)
(See Page 4–45)
TO SL-38 BOARD W500
(See Page 4–46)

Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safty. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

• SIGNAL PATH

	AUDIO SIGNAL
REC	⇨
PB	

• SIGNAL PATH

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		⋙	
Drum servo (speed and phase)		⋙	
Capstan servo (speed and phase)		▷⟫	
Ref. signal	▶	▷	▷

SERVO/SYSTEM CONTROL

VS (SIGNAL I/O) SCHEMATIC DIAGRAM

- Refer to page 4–21 for Printed Wiring Board.

— Ref. No. VS BOARD: 2000 series —
VS BOARD (5/5)
CN202 24P/34P
TALLY
SIRCS VCC
SIRCS SIG
SS GND
JOG
A IN/OUT
CAM/LINE
PB RF
REC AFM RF
1.5M BEV
A FADER
AU 4.9V
AU GND
EZ MIX OUT
AU GND
VA PB MODE
RF SWP
SP/LP
A MUTE
AUDIO L I/O
1.7M BEV
AUDIO R I/O
HP L OUT
HP R OUT
MX ON/OFF
SEL 1
LINE MIX
PB 1.7M BET
MONO REC
MIC MONO
WIND
MX ADJ
SEL 2
(See Page 4–50)
FX630/430/435 : 24P
TO
AU-157 BOARD
CN401 : 24P
FX530 : 34P
TO
AU-168 BOARD
CN1302 :34P
(See Page 4–59)
TO TERMINAL BOARD (J201)
(See Page 4–28)
TO VS BOARD (2/5)-3
(See Page 4–28)
TO VS BOARD (2/5)-5
(See Page 4–26)
TO VS BOARD (1/5)-1
(See Page 4–27)
(See Page 4–27)
(See Page 4–27)
(See Page 4–30)
(See Page 4–28)
(See Page 4–33)
TO
VS BOARD
(2/5)-6
(See Page 4–28)
TO
VS BOARD
(2/5)-6
(See Page 4–28)
TO
VC BOARD
(2/6)
CN601
(See Page 4–16)
(See Page 4–35)
(See Page 4–35, 4–36)
(See Page 4–36)
(See Page 4–84)
(See Page 4–35)
(See Page 4–33)
(See Page 4–33)
(See Page 4–33)

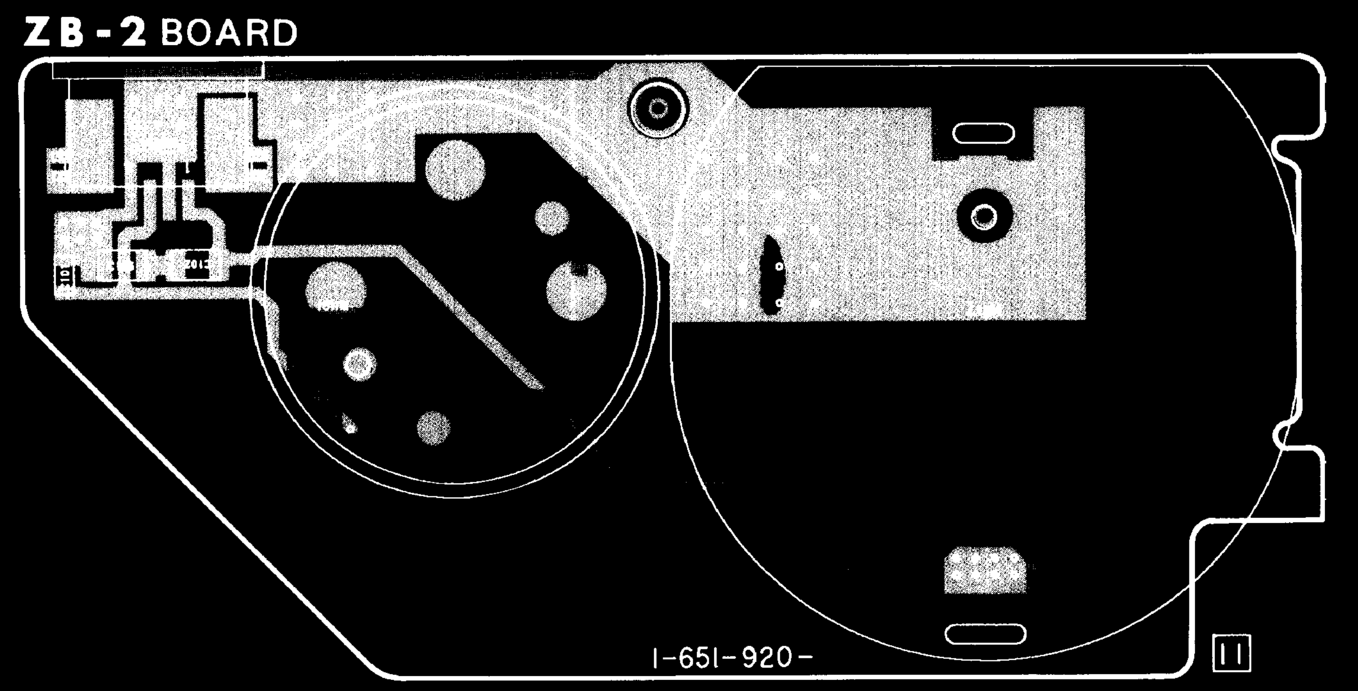
- SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»		➡
PB	⇨	⇨»	⇨»»	⇨

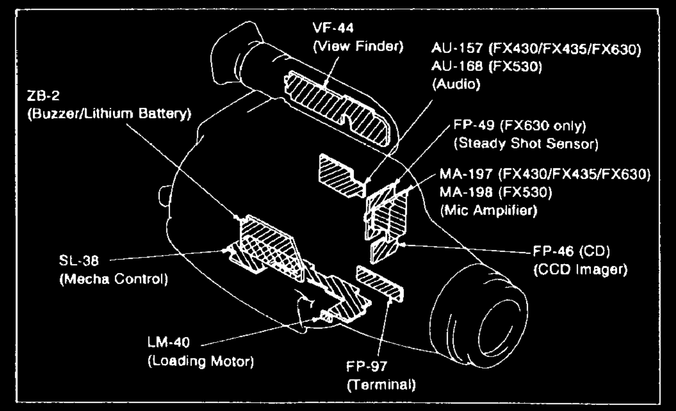
	REC	REC/PB	PB
Ref. signal	➤		▷

ZB-2 (BUZZER/LITHIUM BATTERY) PRINTED WIRING BOARD

— Ref. No. ZB-2 BOARD: 4000 series —

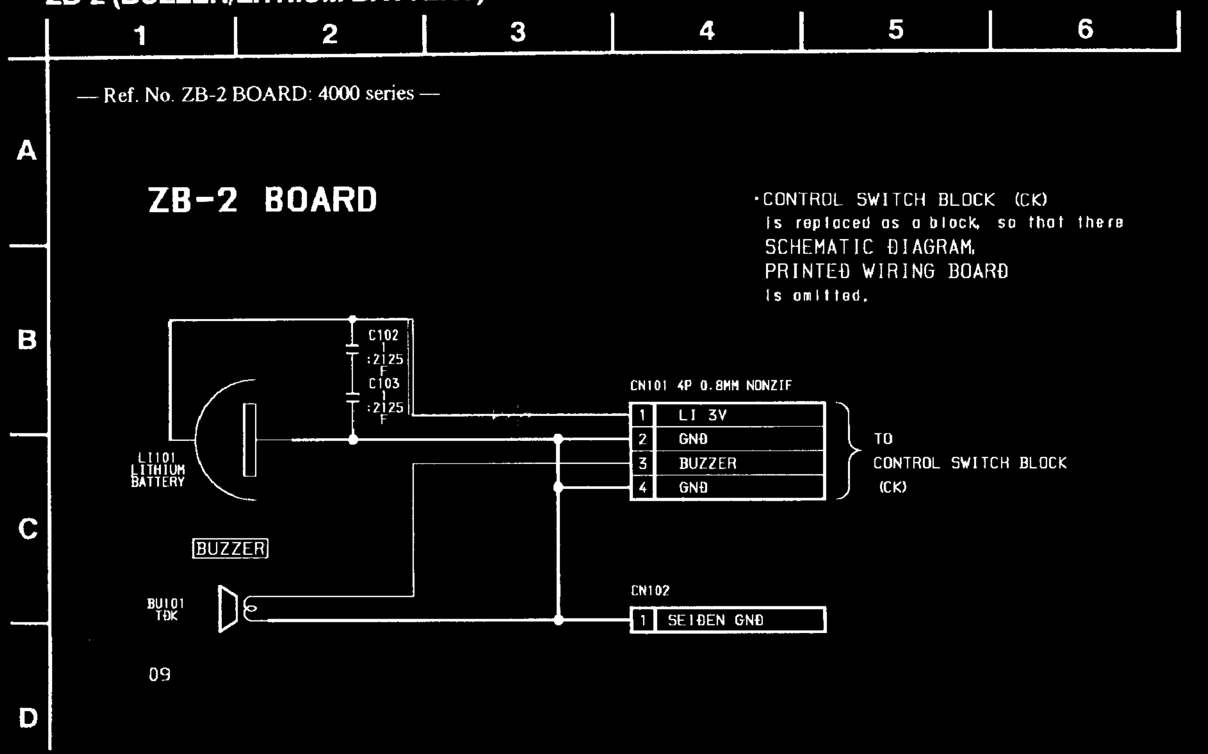

ZB-2 BOARD
1-651-920-
11

- For printed wiring board of ZB-2 board.
- : Pattern from the side which enables seeing.
- : Pattern of the rear side.


VF-44
(View Finder)
AU-157 (FX430/FX435/FX630)
AU-168 (FX530)
(Audio)
ZB-2
(Buzzer/Lithium Battery)
FP-49 (FX630 only)
(Steady Shot Sensor)
MA-197 (FX430/FX435/FX630)
MA-198 (FX530)
(Mic Amplifier)
SL-38
(Mecha Control)
FP-46 (CD)
(CCD Imager)
LM-40
(Loading Motor)
FP-97
(Terminal)

ZB-2 (BUZZER/LITHIUM BATTERY) SCHEMATIC DIAGRAM

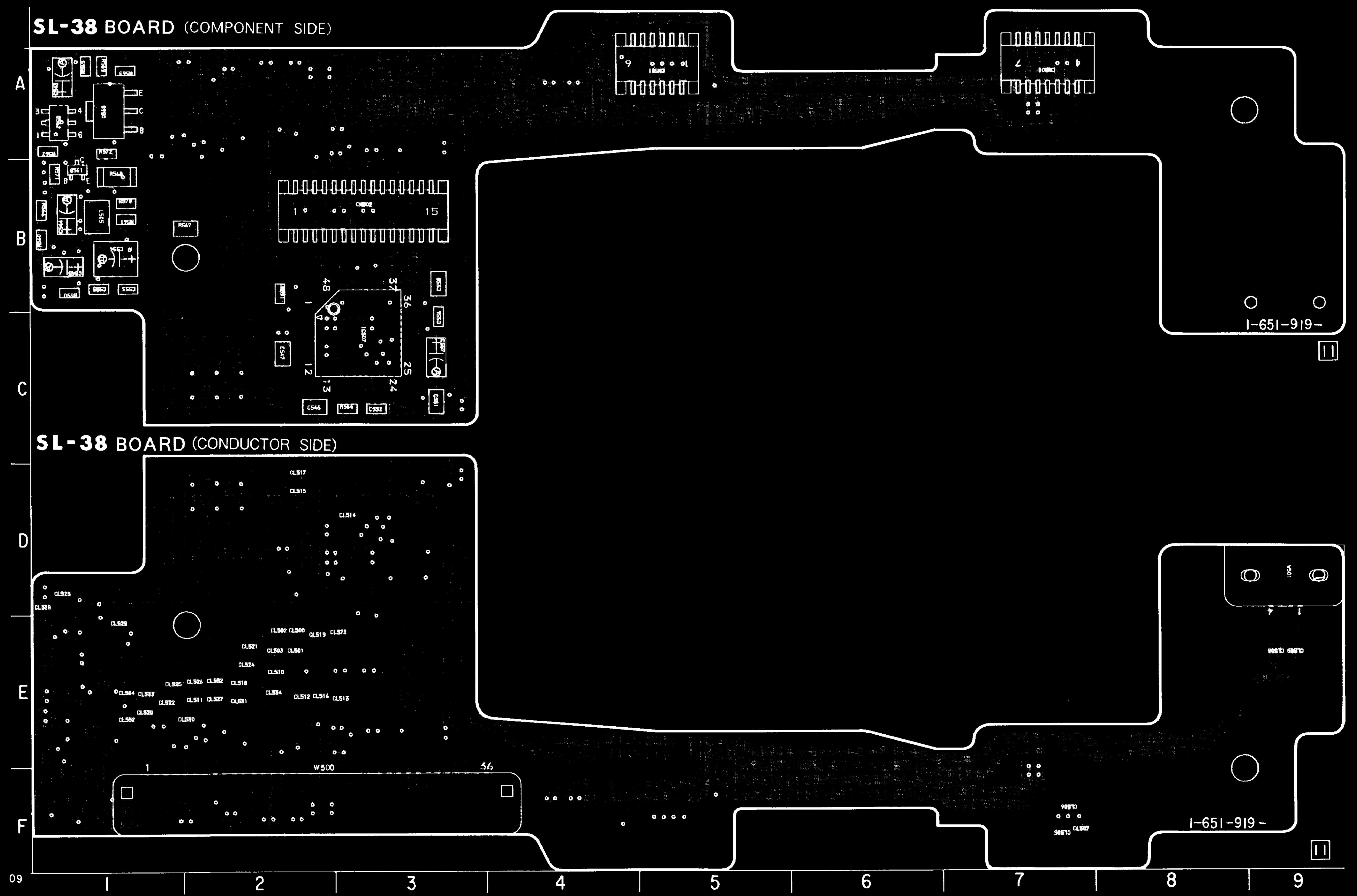
— Ref. No. ZB-2 BOARD: 4000 series —


1
2
3
4
5
6
A
B
C
D
ZB-2 BOARD
C102
1
:Z125
F
C103
1
:Z125
F
LI101
LITHIUM
BATTERY
BUZZER
BU101
TDK
CN101 4P 0.8MM NONZIF
1 LI 3V
2 GND
3 BUZZER
4 GND
TO
CONTROL SWITCH BLOCK
(CK)
CN102
1 SEIDEN GND
09

•CONTROL SWITCH BLOCK (CK)
Is replaced as a block, so that there
SCHEMATIC DIAGRAM,
PRINTED WIRING BOARD
Is omitted.

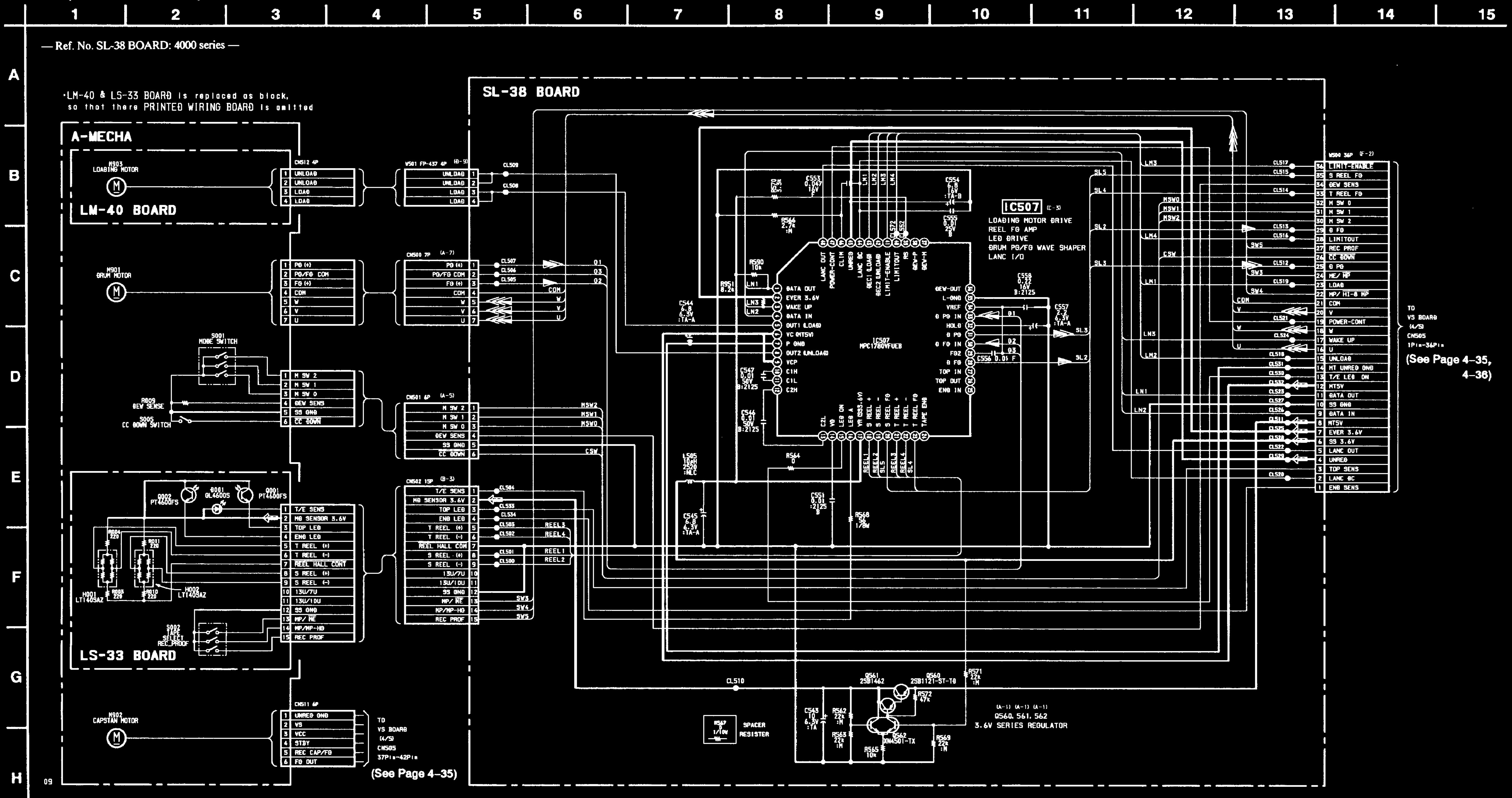
SL-38 (MECHA CONTROL) PRINTED WIRING BOARD

— Ref. No. SL-38 BOARD: 4000 series —


SL-38 BOARD (COMPONENT SIDE)
SL-38 BOARD (CONDUCTOR SIDE)
A
B
C
D
E
F
1
2
3
4
5
6
7
8
9
1-651-919-
11
1
15
48
37
36
12
13
25
24
W500
1
36
1-651-919-
11
09

SL-38 (MECHA CONTROL) SCHEMATIC DIAGRAM

— Ref. No. SL-38 BOARD: 4000 series —


1
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A
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C
D
E
F
G
H
·LM-40 & LS-33 BOARD is replaced as block, so that there PRINTED WIRING BOARD is omitted
A-MECHA
M903 LOADING MOTOR
LM-40 BOARD
M901 DRUM MOTOR
S001 MODE SWITCH
R009 DEW SENSE
S005 CC DOWN SWITCH
LS-33 BOARD
S002 TAPE SELECT REC_PROOF
M902 CAPSTAN MOTOR
SL-38 BOARD
IC507
LOADING MOTOR DRIVE
REEL FG AMP
LED DRIVE
DRUM PG/FG WAVE SHAPER
LANC I/O
IC507 MPC1780VFUEB
Q560, 561, 562
3.6V SERIES REGULATOR
SPACER RESISTER
TO VS BOARD (4/5) CN505 37Pin-42Pin
(See Page 4-35)
TO VS BOARD (4/5) CN505 1Pin-36Pin
(See Page 4-35, 4-36)
09

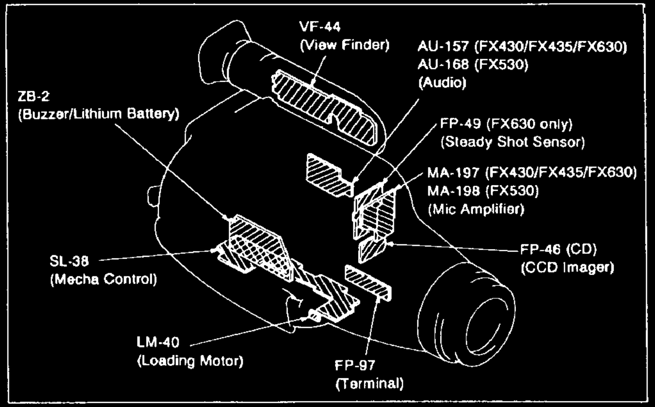
• **SIGNAL PATH**

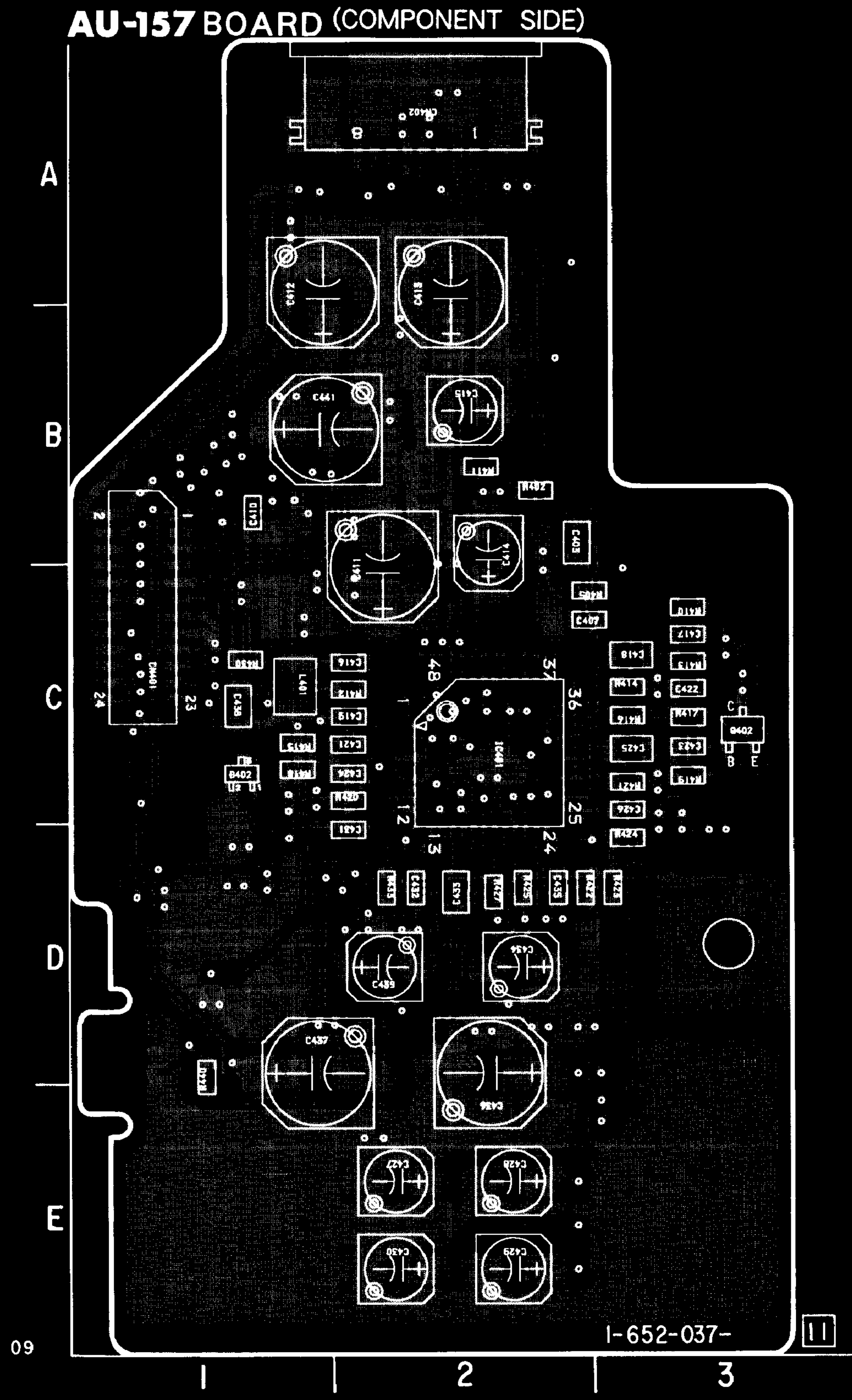
	REC	REC/PB	PB
Drum speed servo		▻	
Drum phase servo		▻▻	
Drum servo (speed and phase)		▻▻▻	

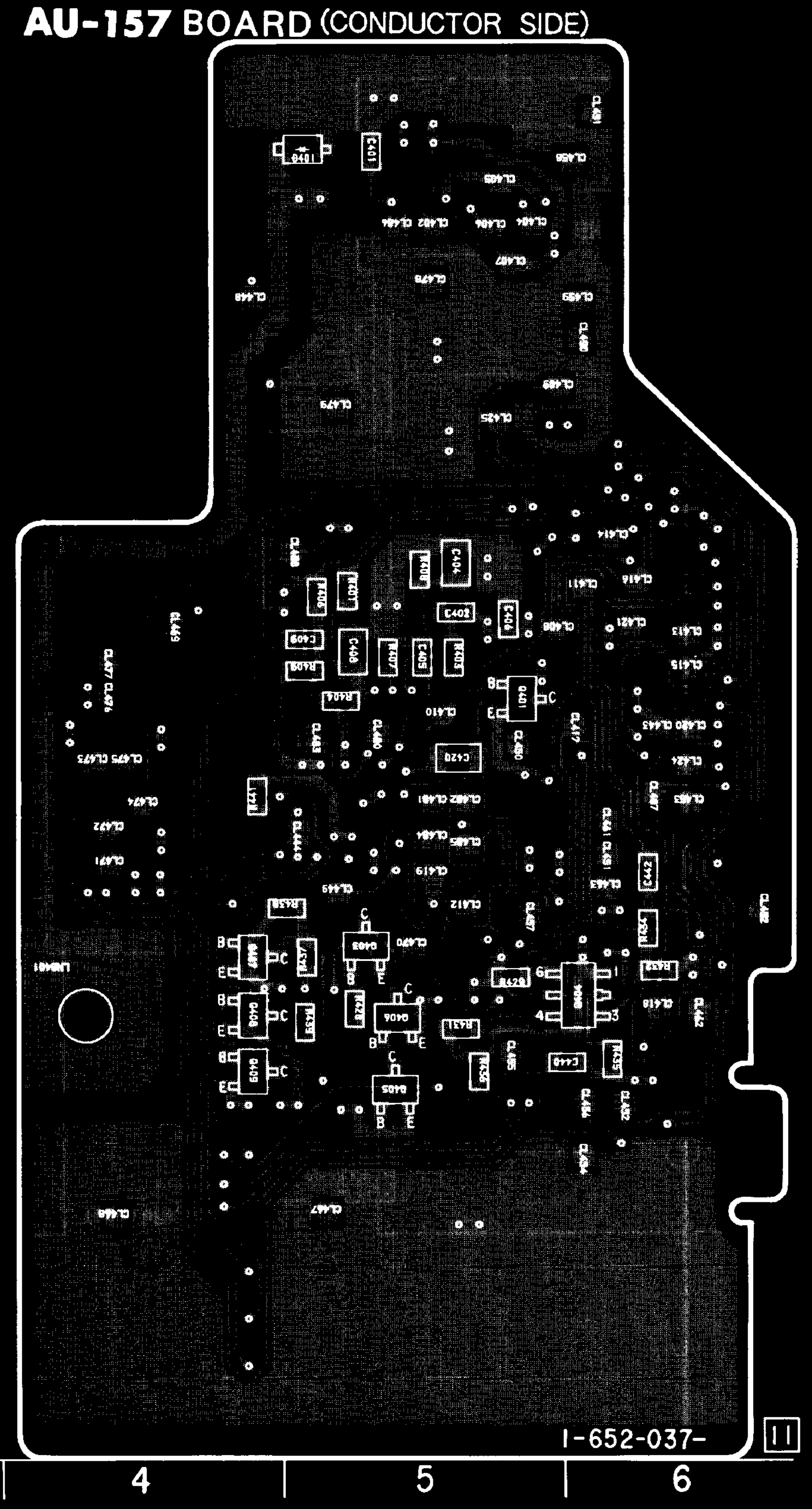
AU-157 (MONO AUDIO) PRINTED WIRING BOARD (CCD-FX430/FX435/FX630)

— Ref. No. AU-157 BOARD: 5000 series —

- **For printed wiring boards.**
- AU-157 board is a four-layer print board. However, the patterns of layers 2 to 3 have not been included in the diagram.


VF-44
(View Finder)
AU-157 (FX430/FX435/FX630)
AU-168 (FX530)
(Audio)
ZB-2
(Buzzer/Lithium Battery)
FP-49 (FX630 only)
(Steady Shot Sensor)
MA-197 (FX430/FX435/FX630)
MA-198 (FX530)
(Mic Amplifier)
SL-38
(Mecha Control)
FP-46 (CD)
(CCD Imager)
LM-40
(Loading Motor)
FP-97
(Terminal)

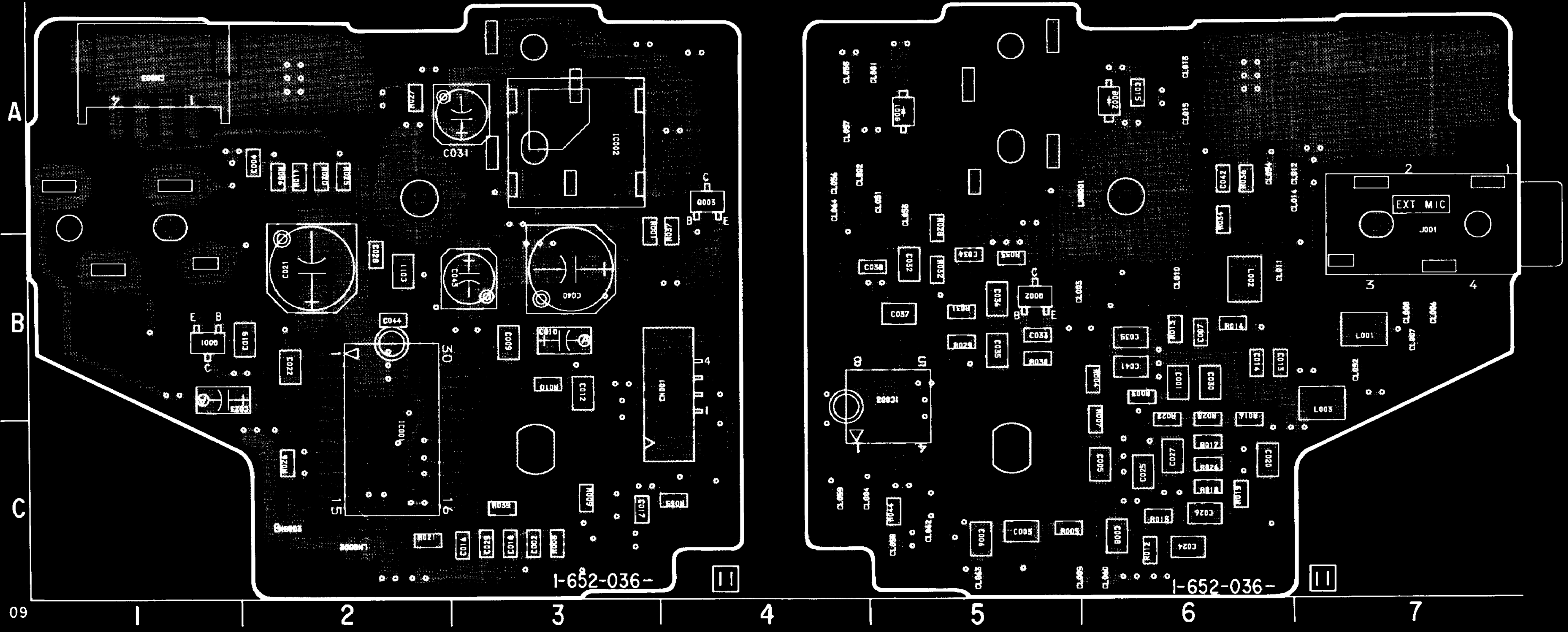

AU-157 BOARD (COMPONENT SIDE)
A
B
C
D
E
09
1
2
3
1-652-037-
11
IC401
C441
C415
C413
C437
C436
C427
C428
C430
C429


AU-157 BOARD (CONDUCTOR SIDE)
4
5
6
1-652-037-
11
Q401
Q402
Q403
Q404
Q405
Q406
Q407
Q408
Q409

MA-197 (MONO MIC AMPLIFIER) PRINTED WIRING BOARD (CCD-FX430/FX435/FX630)

— Ref. No. MA-197 BOARD: 6000 series —

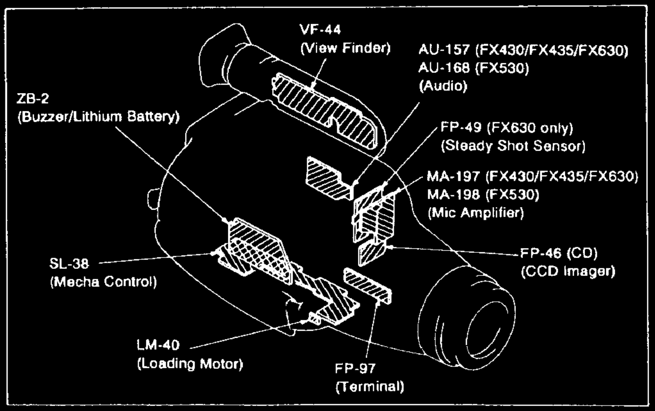
- **For printed wiring boards.**
- MA-197 board is a four-layer print board. However, the patterns of layers 2 to 3 have not been included in the diagram.



MA-197 BOARD (COMPONENT SIDE)

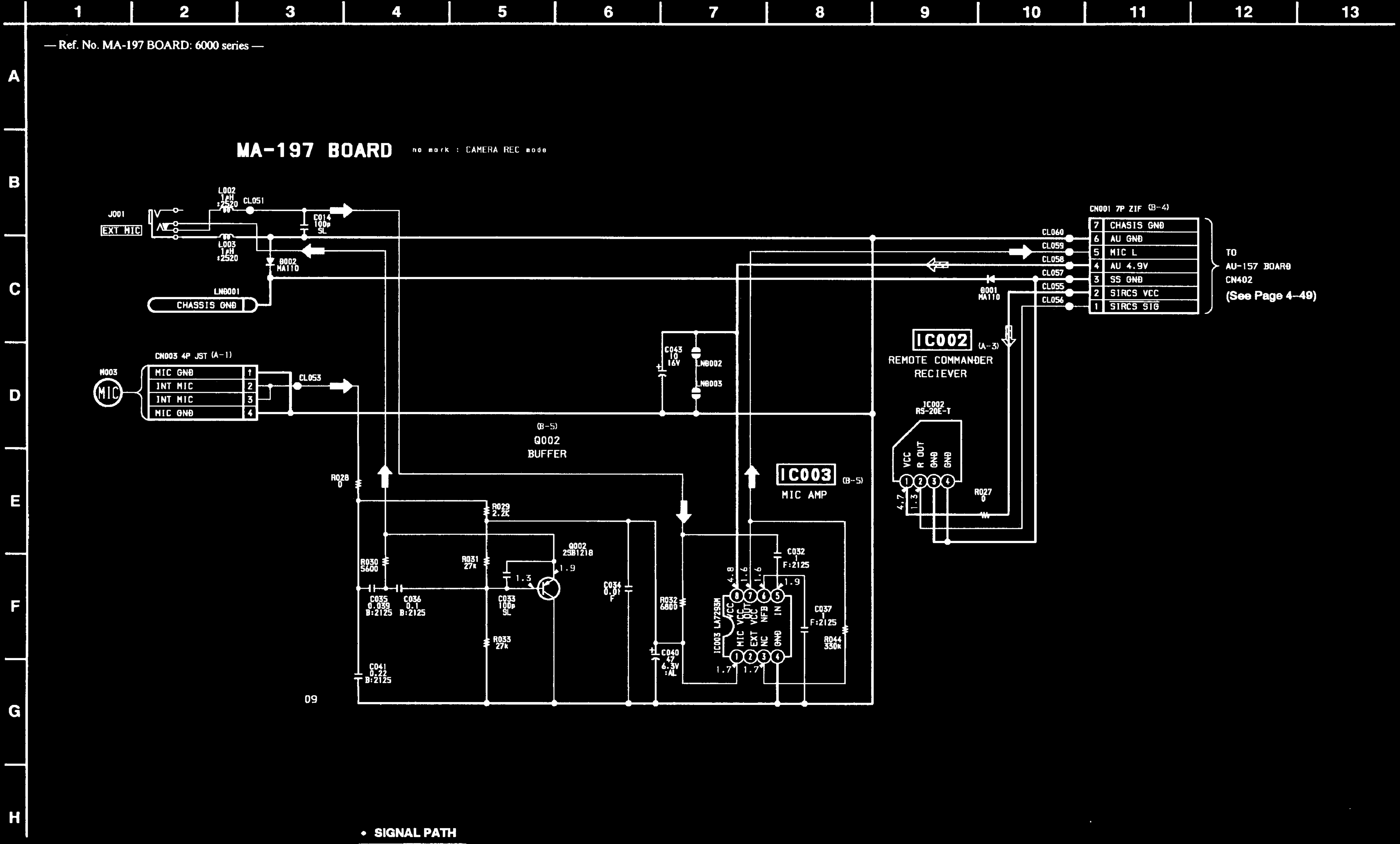
MA-197 BOARD (CONDUCTOR SIDE)

A
B
C
09
1
2
3
4
5
6
7
C031
C021
C043
C040
C044
C022
C019
IC001
CN002
1-652-036-
11
EXT MIC
J001
L001
L002
L003
IC002
Q001
Q002
Q003
E
B
C
1
4
8
5
15
16
30
2
3
1-652-036-
11



VF-44
(View Finder)
AU-157 (FX430/FX435/FX630)
AU-168 (FX530)
(Audio)
ZB-2
(Buzzer/Lithium Battery)
FP-49 (FX630 only)
(Steady Shot Sensor)
MA-197 (FX430/FX435/FX630)
MA-198 (FX530)
(Mic Amplifier)
SL-38
(Mecha Control)
FP-46 (CD)
(CCD Imager)
LM-40
(Loading Motor)
FP-97
(Terminal)

MA-197 (MONO MIC AMPLIFIER) SCHEMATIC DIAGRAM (CCD-FX430/FX435/FX630)



— Ref. No. MA-197 BOARD: 6000 series —

1
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4
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8
9
10
11
12
13
A
B
C
D
E
F
G
H
MA-197 BOARD
no mark : CAMERA REC mode
J001
EXT MIC
L002 1μH :2520
CL051
C014 100p SL
L003 1μH :2520
D002 MA110
LND001
CHASSIS GND
CN003 4P JST (A-1)
M003
MIC
MIC GND 1
INT MIC 2
INT MIC 3
MIC GND 4
CL053
C043 10 16V
LND002
LND003
(B-5)
Q002
BUFFER
R028 0
R029 2.2K
Q002 2SB1218
1.9
1.3
R030 5600
R031 27k
C035 0.039 B:2125
C036 0.1 B:2125
C033 100p SL
R033 27k
C034 0.01 F
C041 0.22 B:2125
09
R032 6800
C040 47 6.3V :AL
IC003 (B-5)
MIC AMP
IC003 LA7293M
VCC
MIC VCC
EXT VCC
OUT
NC
NFB
GND
IN
4.8
1.6
1.6
1.9
1.7
1.7
C032 1 F:2125
C037 1 F:2125
R044 330k
CL060
CL059
CL058
CL057
CL055
CL056
D001 MA110
CN001 7P ZIF (B-4)
7 CHASIS GND
6 AU GND
5 MIC L
4 AU 4.9V
3 SS GND
2 SIRCS VCC
1 SIRCS SIG
TO AU-157 BOARD CN402
(See Page 4-49)
IC002 (A-3)
REMOTE COMMANDER RECIEVER
IC002 RS-20E-T
VCC
R OUT
GND
GND
4.7
1.3
R027 0

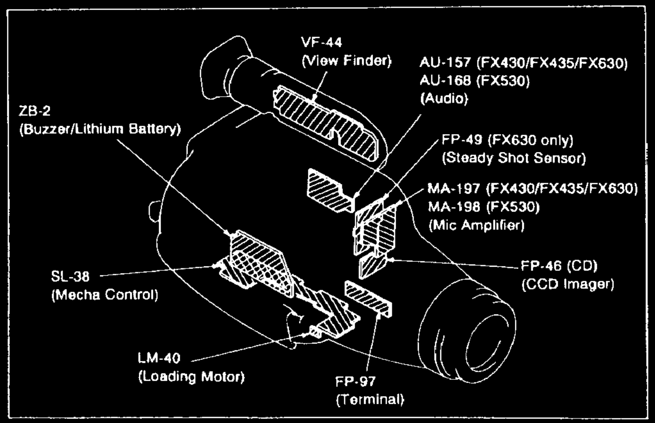
• SIGNAL PATH

	AUDIO SIGNAL
REC	➡
PB	

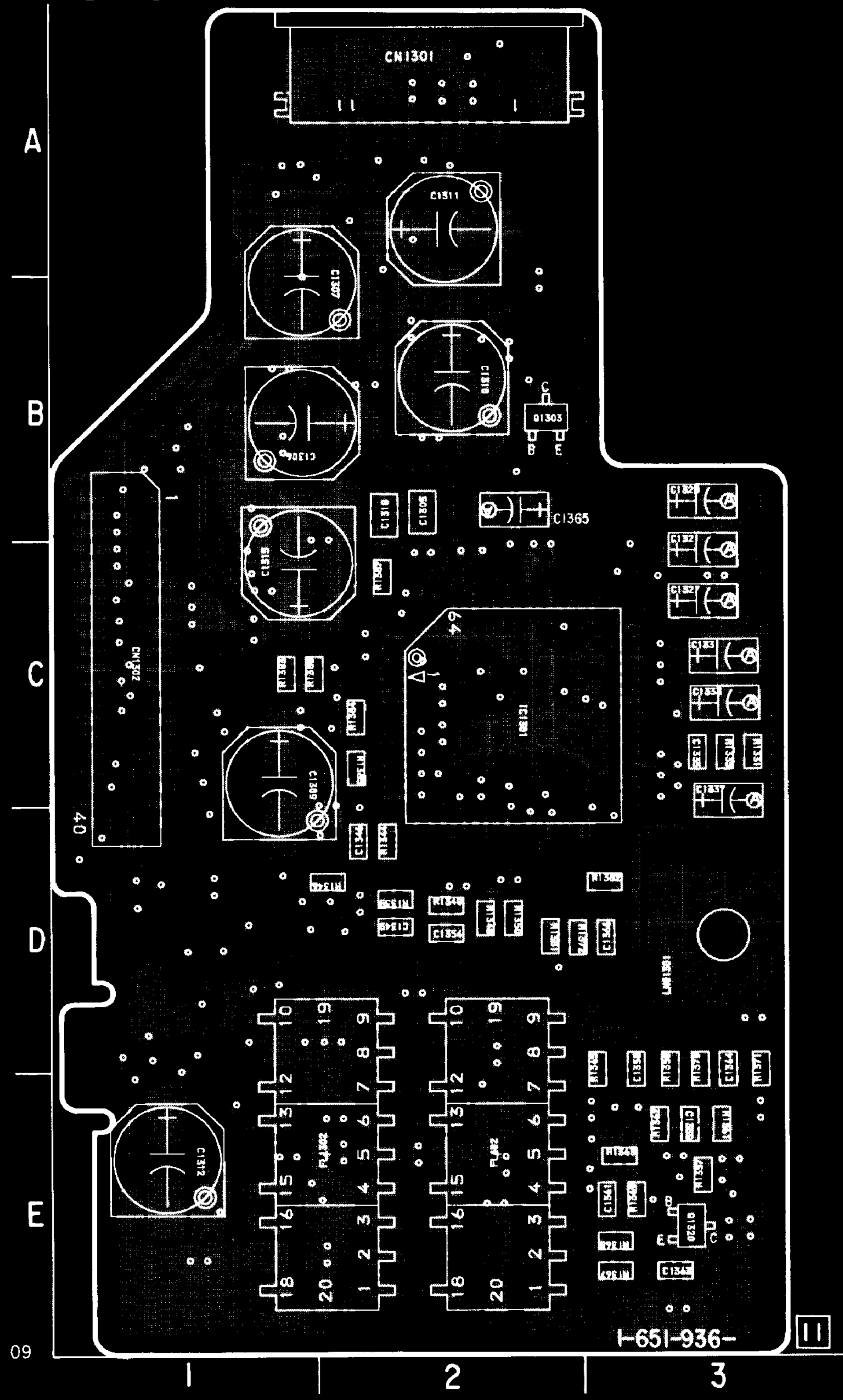
AU-168 (ST AUDIO) PRINTED WIRING BOARD (CCD-FX530)

— Ref. No. AU-168 BOARD: 10000 series —

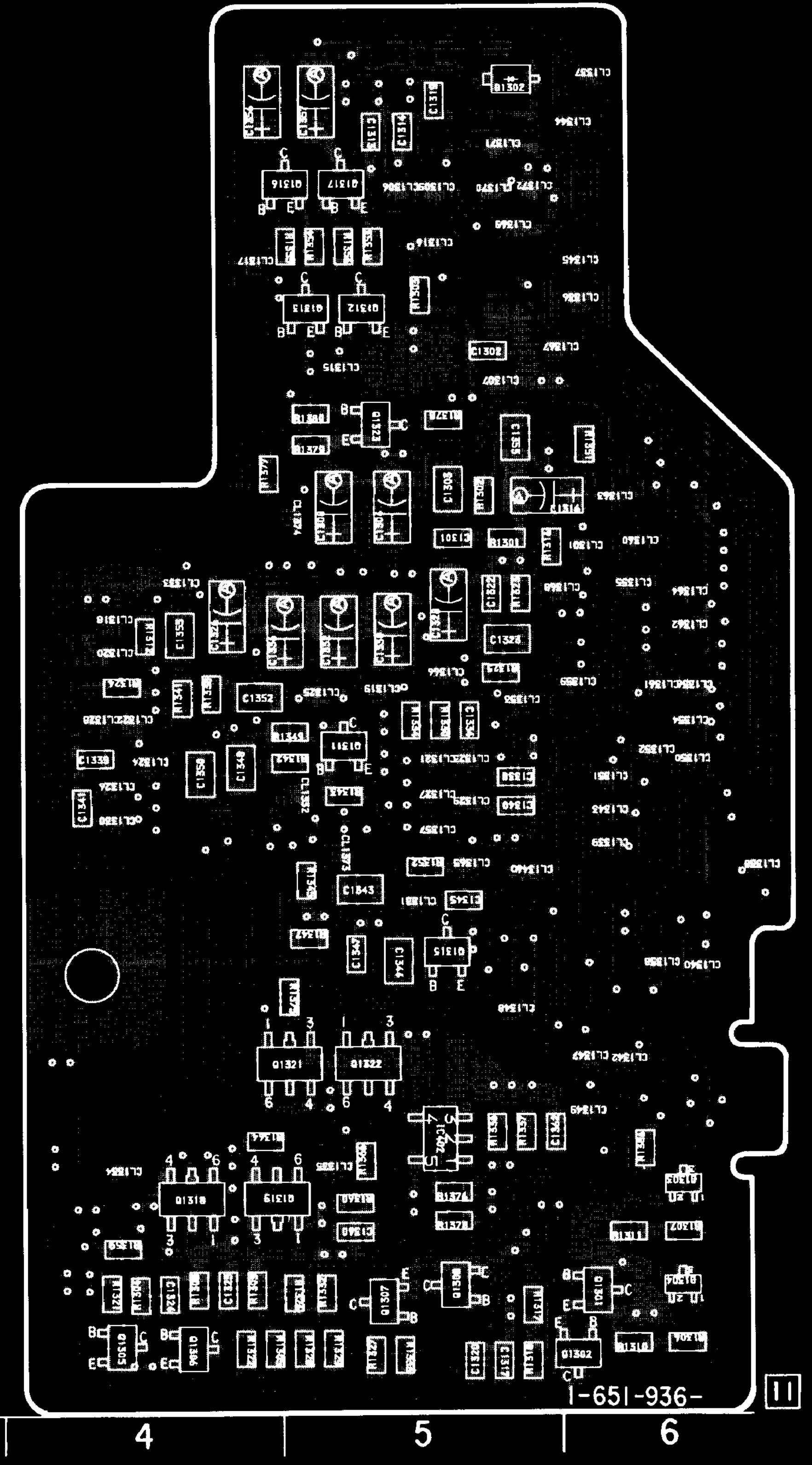
- **For printed wiring boards.**
- AU-168 board is a four-layer print board. However, the patterns of layers 2 to 3 have not been included in the diagram.


VF-44
(View Finder)
AU-157 (FX430/FX435/FX630)
AU-168 (FX530)
(Audio)
ZB-2
(Buzzer/Lithium Battery)
FP-49 (FX630 only)
(Steady Shot Sensor)
MA-197 (FX430/FX435/FX630)
MA-198 (FX530)
(Mic Amplifier)
SL-38
(Mecha Control)
FP-46 (CD)
(CCD Imager)
LM-40
(Loading Motor)
FP-97
(Terminal)

AU-168 BOARD (COMPONENT SIDE)

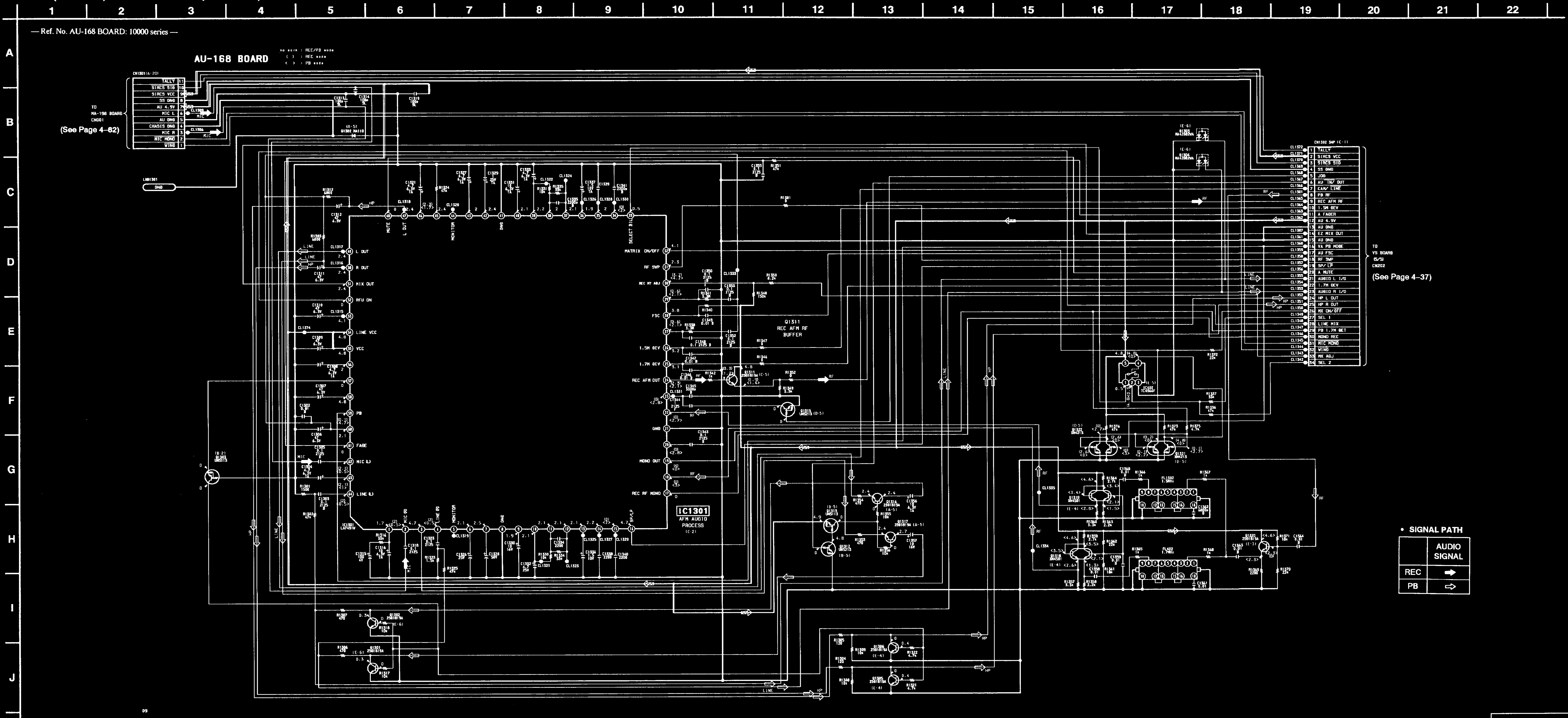

A
B
C
D
E
1
2
3
09
CN1301
C1311
C1307
C1308
C1306
Q1303
C1365
C1319
C1309
C1312
CN1302
IC1301
40
64
1-651-936-
11

AU-168 BOARD (CONDUCTOR SIDE)


4
5
6
Q1302
Q1316
Q1317
Q1313
Q1312
Q1303
Q1315
Q1321
Q1322
Q1318
Q1319
C1352
C1343
1-651-936-
11

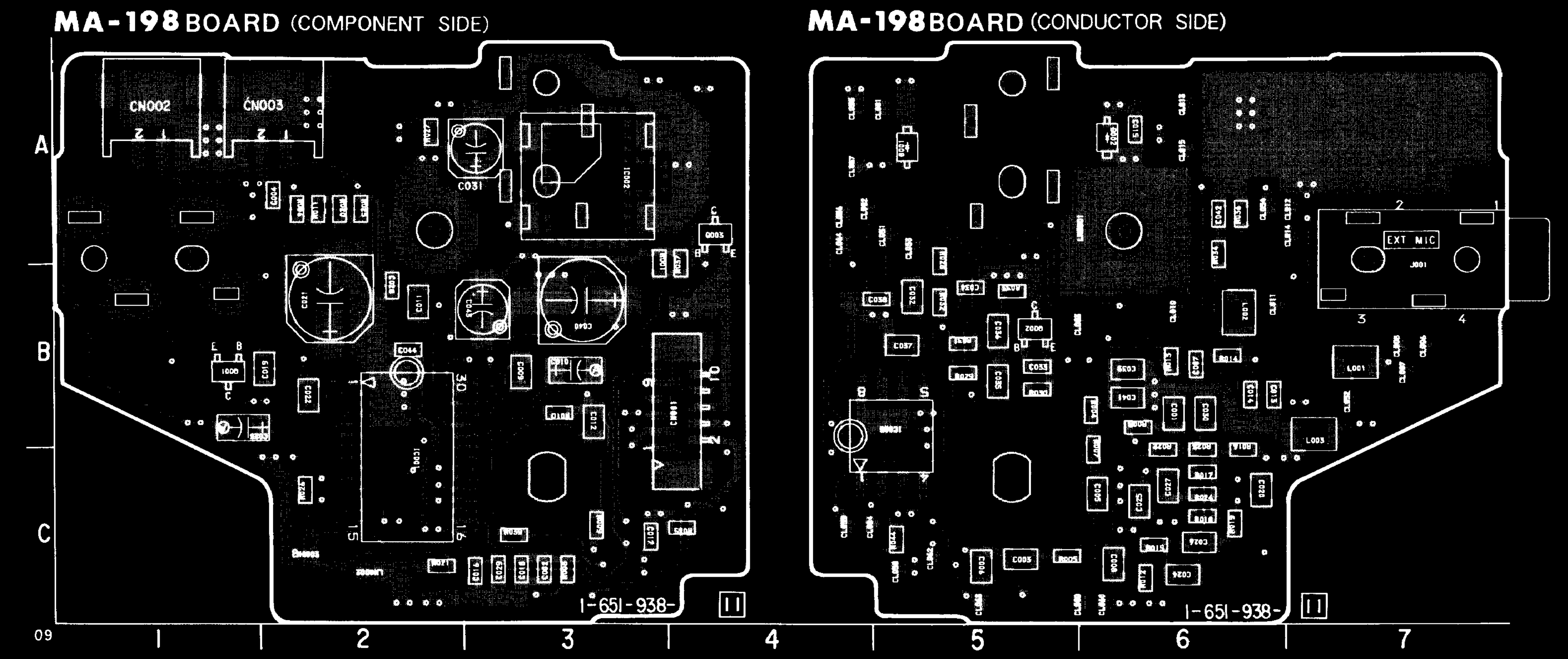
AU-168 (ST AUDIO) SCHEMATIC DIAGRAM (CCD-FX530)

— Ref. No. AU-168 BOARD: 10000 series —

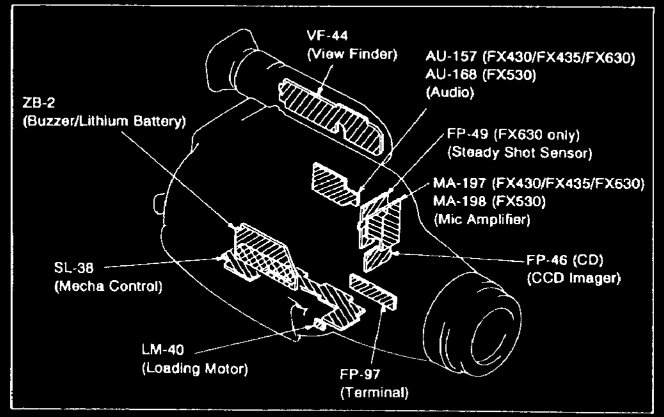

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
A
B
C
D
E
F
G
H
I
J
AU-168 BOARD
no mark : REC/PB mode
( ) : REC mode
< > : PB mode
CN1301 (A-20)
TALLY 11
SIRCS SIG 10
SIRCS VCC 9
SS GND 8
AU 4.9V 7
MIC L 6
AU GND 5
CHASIS GND 4
MIC R 3
MIC MONO 2
WIND 1
TO
MA-198 BOARD
CN001
(See Page 4–62)
CL1305
CL1306
MIC
C1313 100p SL
C1314 100p SL
C1319 100p SL
(A-5)
D1302 MA110
LND1301
GND
IC1301
AFM AUDIO
PROCESS
(C-2)
MUTE
L OUT
MONITOR
SELECT BIAS
MATRIX ON/OFF
RF SWP
REC MT ADJ
FSC
1.5M DEV
1.7M DEV
REC AFM OUT
GND
MONO OUT
REC RF MONO
SP/LP
L OUT
R OUT
MIX OUT
RFU ON
LINE VCC
VCC
PB
FADE
MIC (L)
LINE (L)
Q1311
REC AFM RF
BUFFER
CL1325
CL1327
CL1329
C1336 1.5 10V
C1338 2200
C1340 2200
RF
LINE
HP
CN1302 34P (C-1)
CL1372 1 TALLY
CL1371 2 SIRCS VCC
CL1370 3 SIRCS SIG
CL1369 4 SS GND
CL1368 5 JOG
CL1367 6 AU IN/ OUT
CL1366 7 CAM/ LINE
CL1301 8 PB RF
CL1365 9 REC AFM RF
CL1364 10 1.5M DEV
CL1363 11 A FADER
CL1362 12 AU 4.9V
13 AU GND
CL1307 14 EZ MIX OUT
CL1361 15 AU GND
CL1360 16 VA PB MODE
CL1359 17 AU FSC
CL1358 18 RF SWP
CL1357 19 SP/ LP
CL1356 20 A MUTE
CL1355 21 AUDIO L I/O
CL1354 22 1.7M DEV
CL1353 23 AUDIO R I/O
CL1352 24 HP L OUT
CL1351 25 HP R OUT
CL1350 26 MX ON/OFF
CL1349 27 SEL 1
CL1348 28 LINE MIX
CL1347 29 PB 1.7M SET
CL1346 30 MONO REC
CL1345 31 MIC MONO
CL1344 32 WIND
CL1343 33 MX ADJ
CL1342 34 SEL 2
TO
VS BOARD
(5/5)
CN202
(See Page 4–37)
• SIGNAL PATH
AUDIO SIGNAL
REC ➡
PB ⇨

MA-198 (ST MIC AMPLIFIER) PRINTED WIRING BOARD (CCD-FX530)

— Ref. No. MA-198 BOARD: 7000 series —

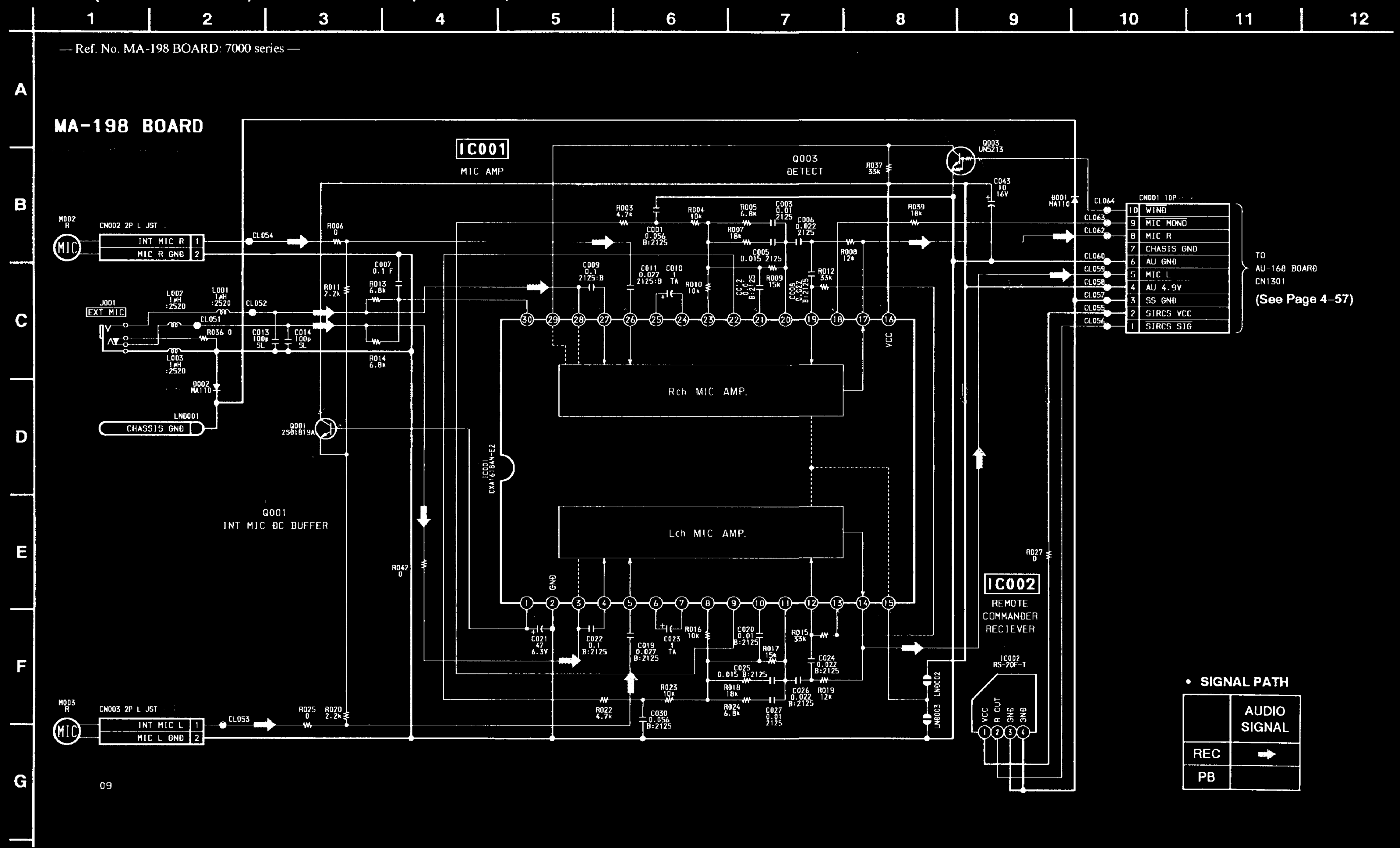

MA-198 BOARD (COMPONENT SIDE)
MA-198 BOARD (CONDUCTOR SIDE)
CN002
CN003
C031
EXT MIC
1-651-938-
11
09
A
B
C
1
2
3
4
5
6
7

- **For printed wiring boards.**
- MA-198 board is a four-layer print board. However, the patterns of layers 2 to 3 have not been included in the diagram.


VF-44 (View Finder)
AU-157 (FX430/FX435/FX630) AU-168 (FX530) (Audio)
ZB-2 (Buzzer/Lithium Battery)
FP-49 (FX630 only) (Steady Shot Sensor)
MA-197 (FX430/FX435/FX630) MA-198 (FX530) (Mic Amplifier)
SL-38 (Mecha Control)
FP-46 (CD) (CCD Imager)
LM-40 (Loading Motor)
FP-97 (Terminal)

MA-198 (ST MIC AMPLIFIER) SCHEMATIC DIAGRAM (CCD-FX530)

— Ref. No. MA-198 BOARD: 7000 series —

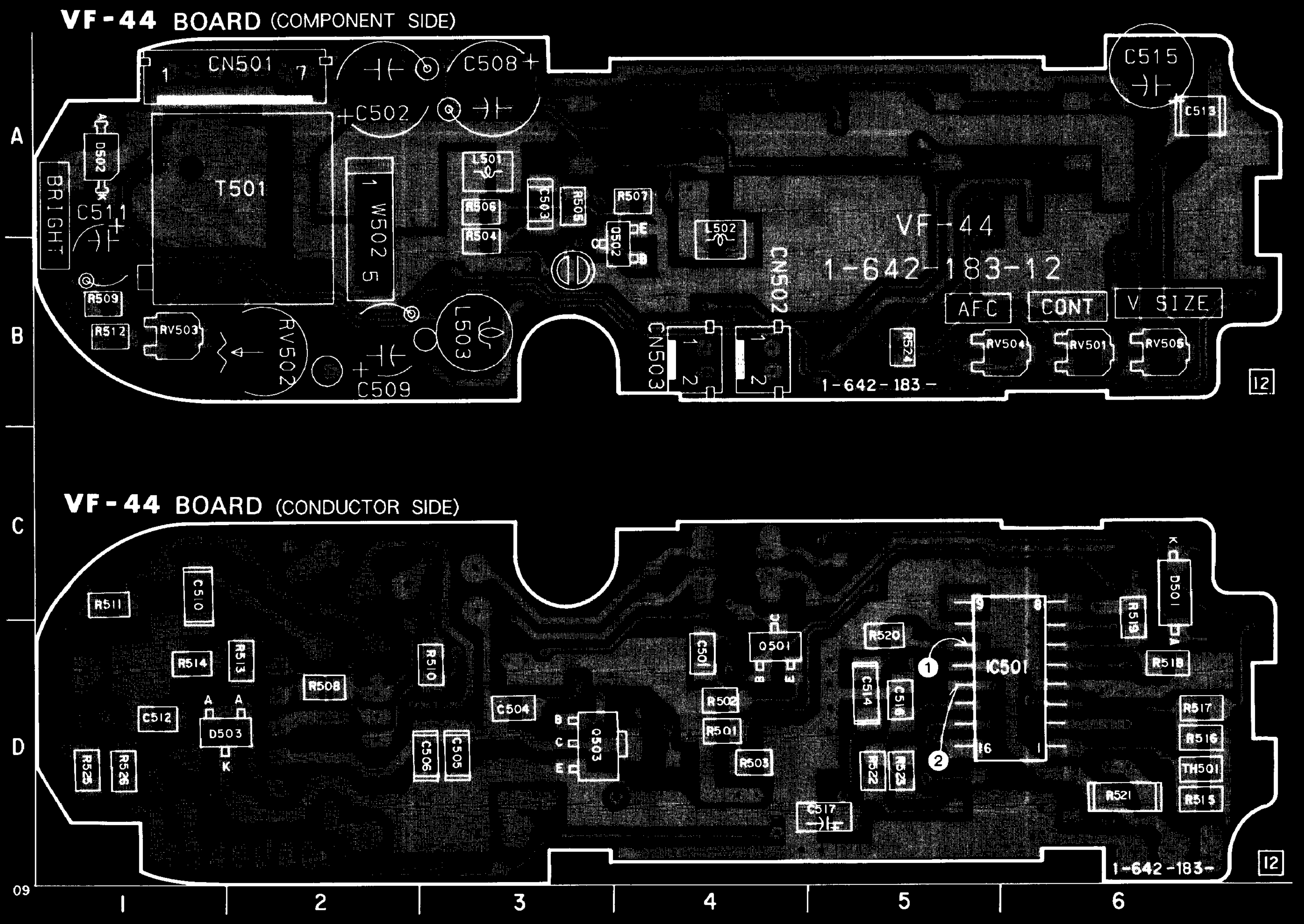

1
2
3
4
5
6
7
8
9
10
11
12
A
B
C
D
E
F
G
MA-198 BOARD
IC001
MIC AMP
Q003 DETECT
Q003 UN5213
M002 R
CN002 2P L JST
INT MIC R
MIC R GND
J001 EXT MIC
LN6001
CHASSIS GND
Q001 2SB1819A
Q001 INT MIC DC BUFFER
Rch MIC AMP.
Lch MIC AMP.
IC001 CXA1616AN-E2
VCC
GND
IC002
REMOTE COMMANDER RECIEVER
IC002 RS-20E-1
VCC
R OUT
GND
GND
M003 L
CN003 2P L JST
INT MIC L
MIC L GND
D001 MA110
C043 10 16V
CN001 10P
10 WIND
9 MIC MONO
8 MIC R
7 CHASIS GND
6 AU GND
5 MIC L
4 AU 4.9V
3 SS GND
2 SIRCS VCC
1 SIRCS SIG
TO AU-168 BOARD CN1301
(See Page 4-57)
09

- **SIGNAL PATH**

	AUDIO SIGNAL
REC	➡
PB	

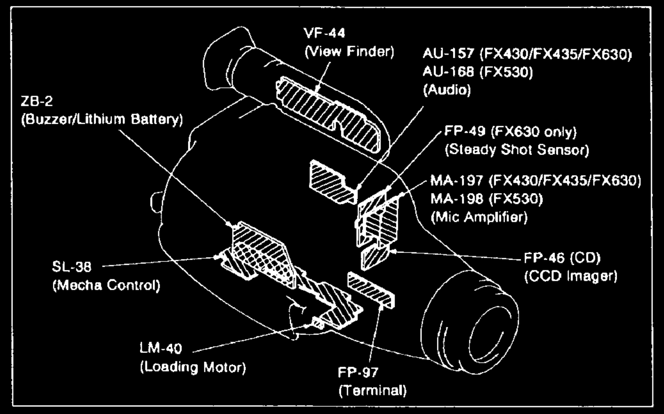
VF-44 (VIEW FINDER) SCHEMATIC DIAGRAM

— Ref. No. VF-44 BOARD: 8000 series —


VF-44 BOARD (COMPONENT SIDE)

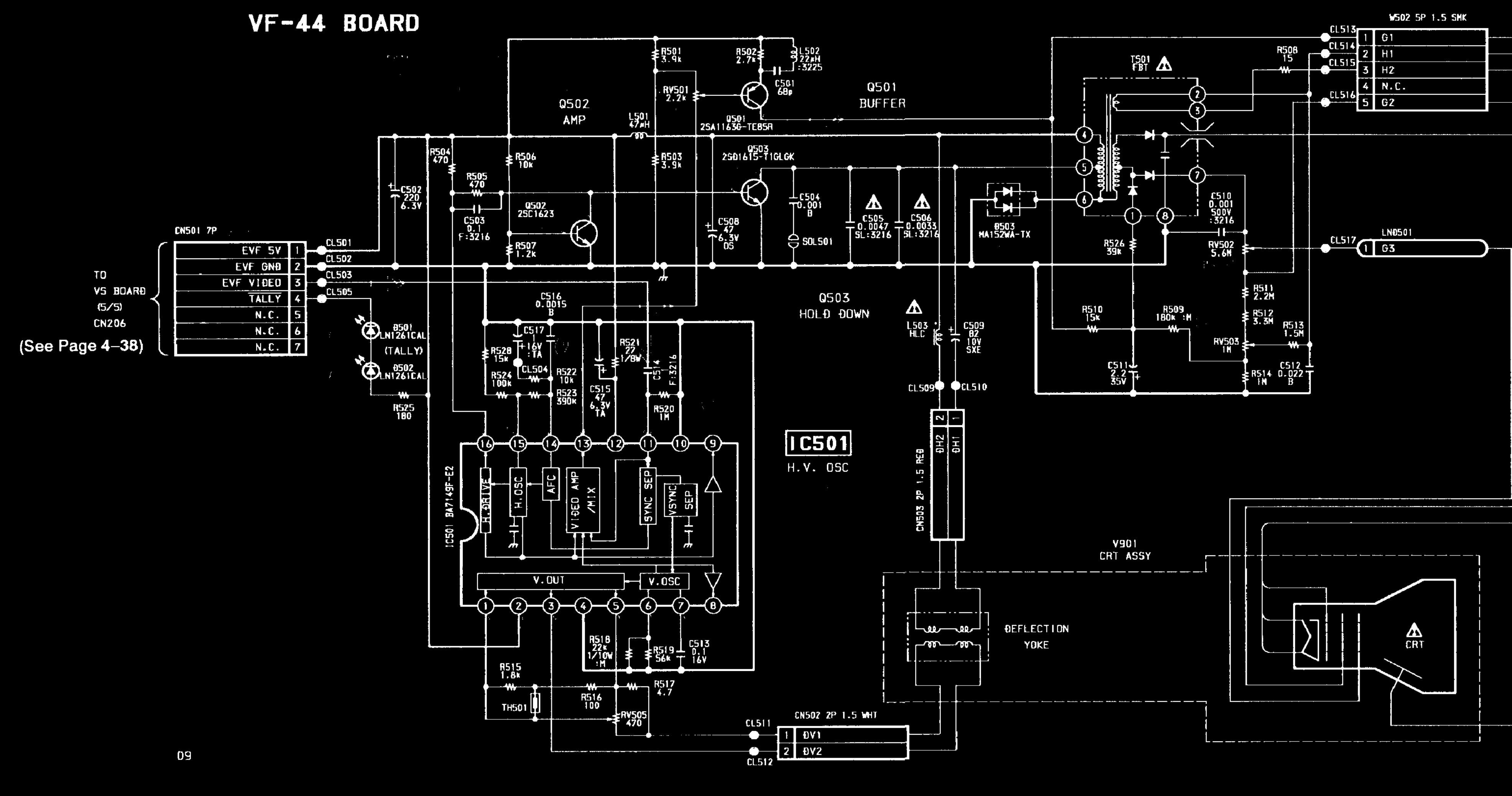
VF-44 BOARD (CONDUCTOR SIDE)
CN501
1
7
C508
C502
C515
C513
BRIGHT
D502
T501
C511
R509
R512
RV503
RV502
W502
L501
R506
R504
C503
R508
R507
Q502
L502
CN502
VF-44
1-642-183-12
AFC
CONT
V SIZE
RV504
RV501
RV505
CN503
L503
C509
1-642-183-
12
R511
C510
R514
R513
C512
D503
R524
R526
R510
C506
C505
C504
Q503
C501
Q501
R502
R501
R503
R520
C514
C516
IC501
①
②
R522
R523
C517
D501
R519
R518
R517
R516
TH501
R515
R521
A
B
C
D
09
1
2
3
4
5
6

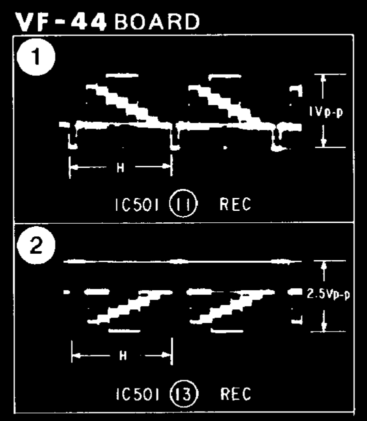
- For printed wiring boards.
- ○ : Through hole is omitted.


VF-44 (View Finder)
AU-157 (FX430/FX435/FX630)
AU-168 (FX530)
(Audio)
ZB-2 (Buzzer/Lithium Battery)
FP-49 (FX630 only)
(Steady Shot Sensor)
MA-197 (FX430/FX435/FX630)
MA-198 (FX530)
(Mic Amplifier)
SL-38 (Mecha Control)
FP-46 (CD)
(CCD imager)
LM-40 (Loading Motor)
FP-97 (Terminal)

VF-44 (VIEW FINDER) PRINTED WIRING BOARD

— Ref. No. VF-44 BOARD: 8000 series —


VF-44 BOARD
1
2
3
4
5
6
7
8
9
10
11
12
A
B
C
D
E
F
G
H
I
TO VS BOARD (S/S) CN206
(See Page 4-38)
CN501 7P
EVF 5V
EVF GND
EVF VIDEO
TALLY
N.C.
N.C.
N.C.
CL501
CL502
CL503
CL505
D501 LN1261CAL (TALLY)
D502 LN1261CAL
Q502 AMP
Q501 BUFFER
Q503 HOLD DOWN
IC501 H.V. OSC
IC501 BA7148F-E2
V.OUT
V.OSC
SYNC SEP
VIDEO AMP
T501 FBT
W502 5P 1.5 SMK
G1
H1
H2
N.C.
G2
G3
CL513
CL514
CL515
CL516
CL517
CN503 2P 1.5 RED
V901 CRT ASSY
DEFLECTION YOKE
CRT
CN502 2P 1.5 WHT
DY1
DY2
CL511
CL512
09

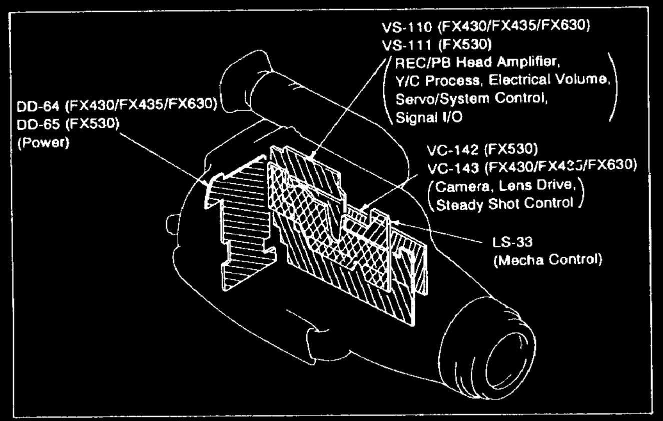


Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safty. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- SIGNAL PATH

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC			
PB			

- **For printed wiring boards.**
- DD board is a four-layer print board. However, the patterns of layers 2 to 3 have not been included in the diagram.

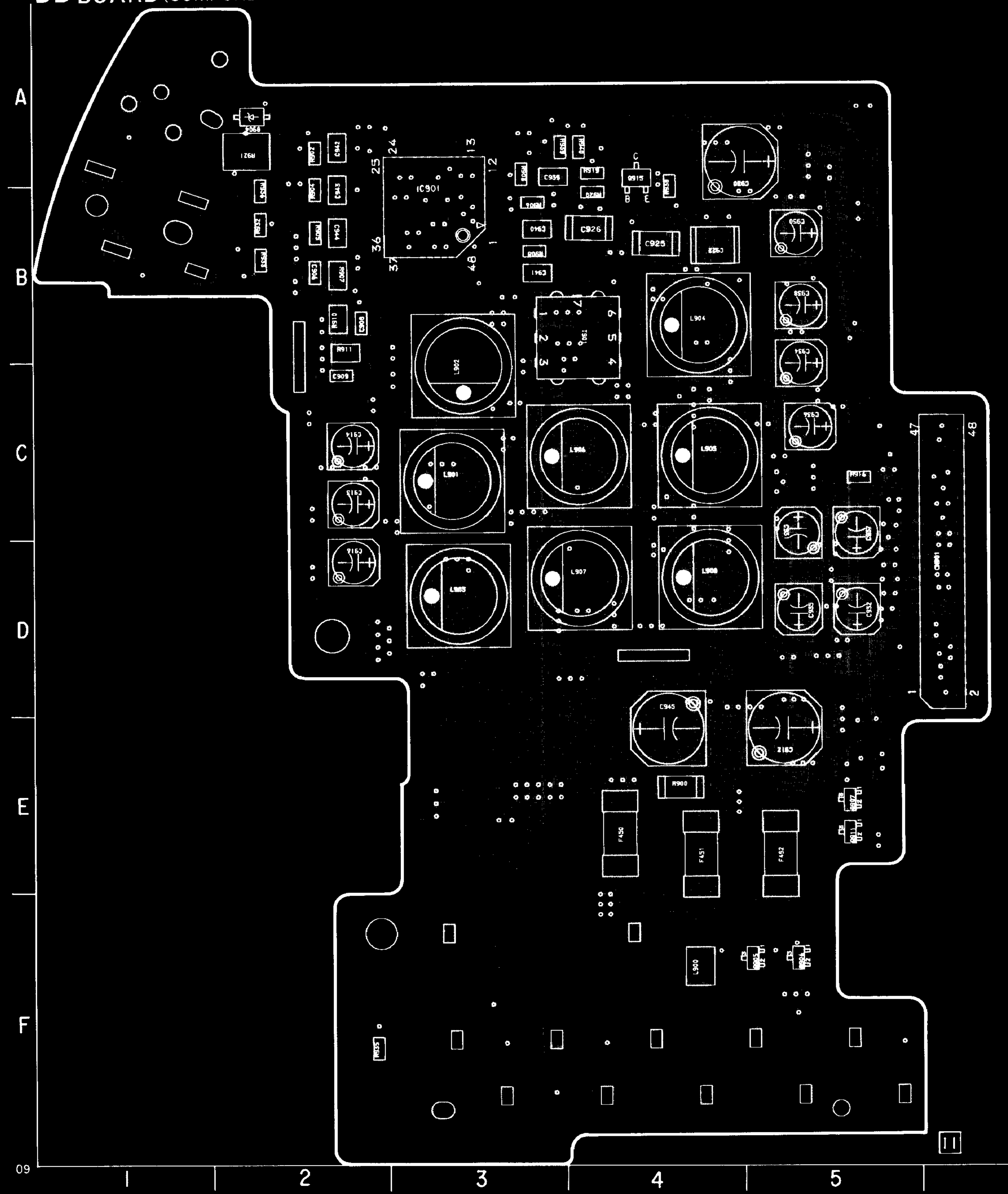

VS-110 (FX430/FX435/FX630)
VS-111 (FX530)
(REC/PB Head Amplifier, Y/C Process, Electrical Volume, Servo/System Control, Signal I/O)
DD-64 (FX430/FX435/FX630)
DD-65 (FX530)
(Power)
VC-142 (FX530)
VC-143 (FX430/FX435/FX630)
(Camera, Lens Drive, Steady Shot Control)
LS-33
(Mecha Control)

DD (POWER) PRINTED WIRING BOARD

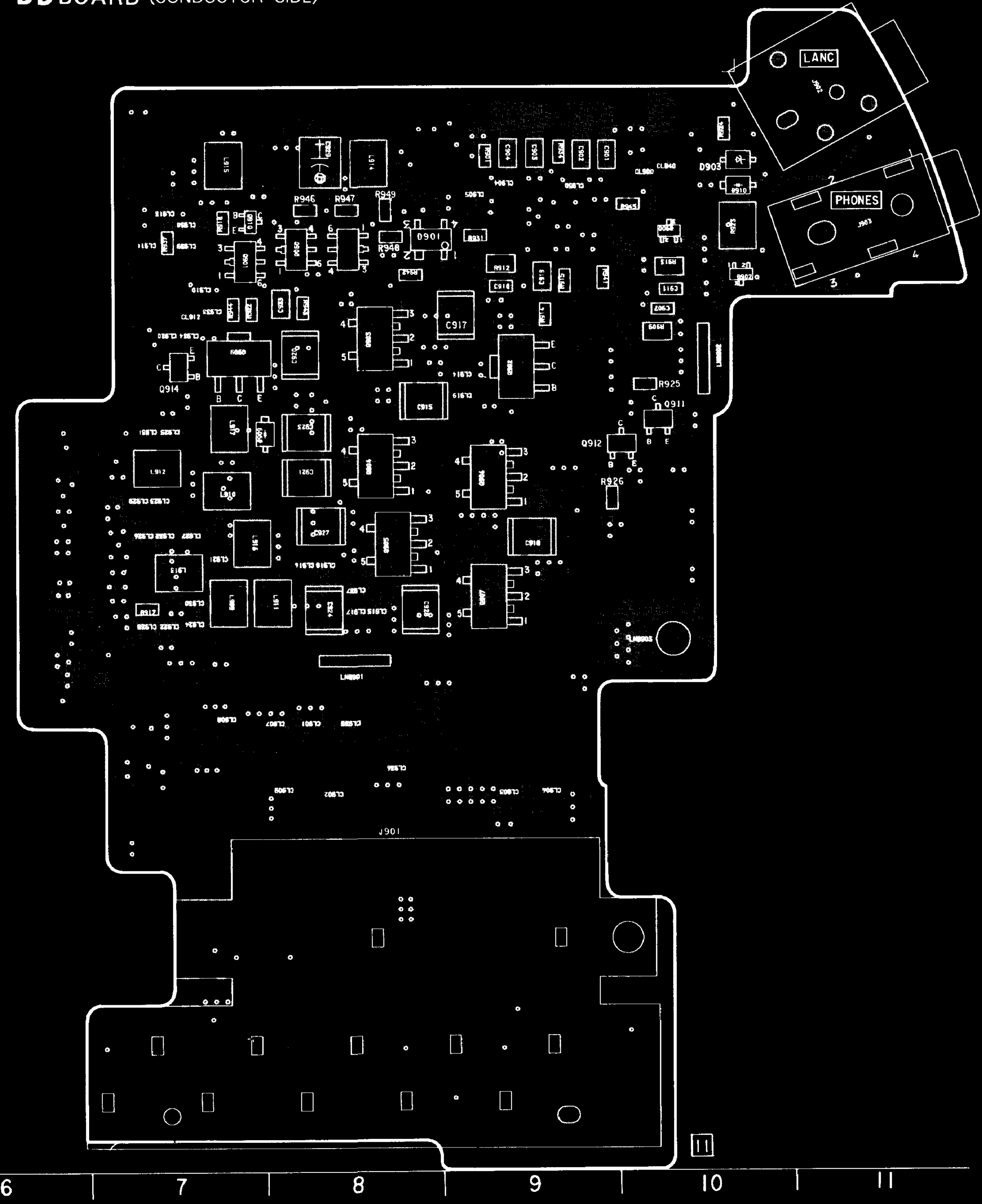
— Ref. No. DD BOARD: 9000 series —

FX430/FX435/FX630	DD-64	1-652-089-11
FX530	DD-65	1-651-941-11

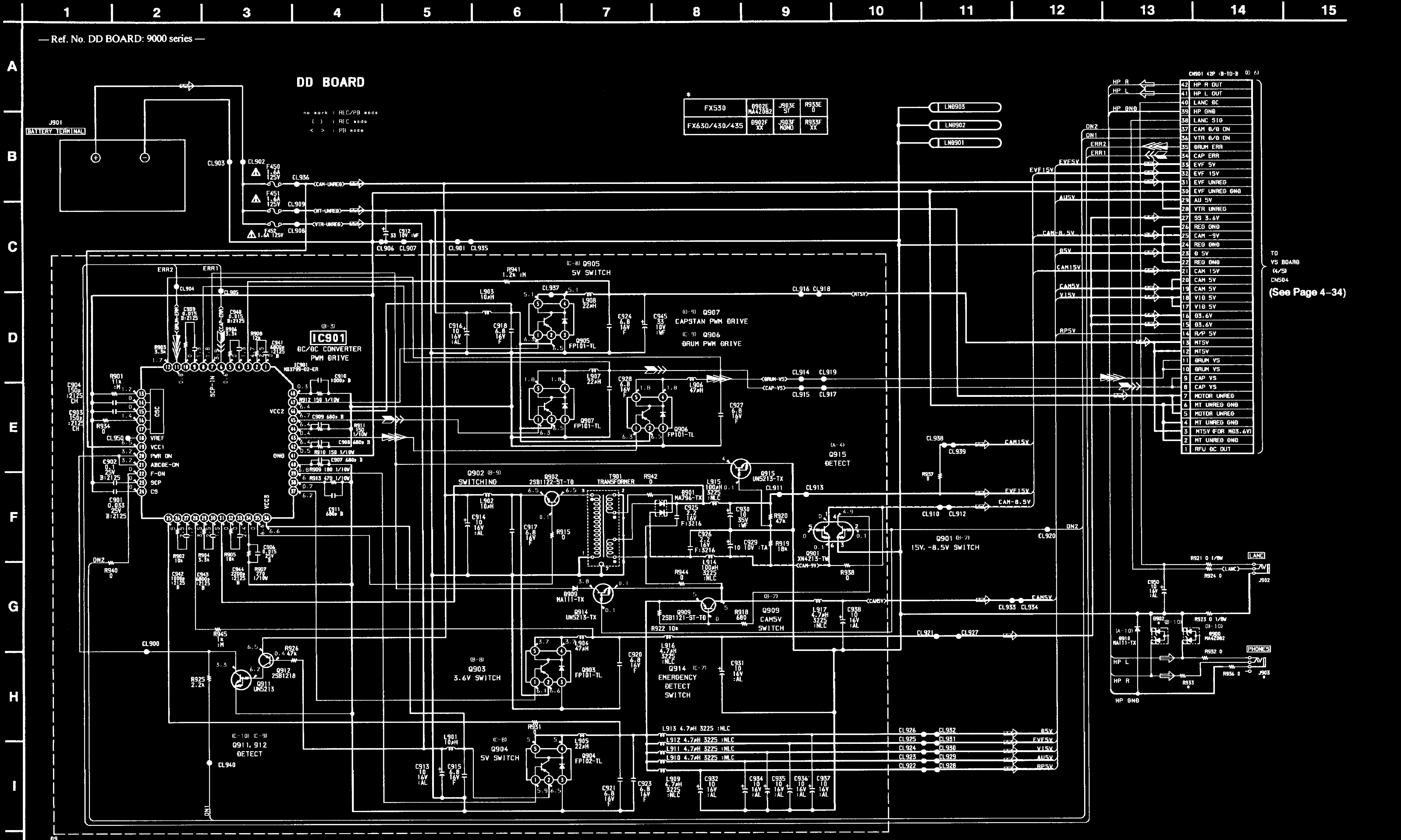
DD BOARD (COMPONENT SIDE)


A
B
C
D
E
F
09
1
2
3
4
5
6
IC901
L901
L902
L903
L904
L905
L906
L907
L908
F901
F902
F903
CN901
11

DD BOARD (CONDUCTOR SIDE)


LANC
PHONES
J901
J902
R946
R947
R949
D901
D903
Q911
Q912
Q914
R925
R926
C917
7
8
9
10
11
11

DD (POWER) SCHEMATIC DIAGRAM


1
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7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
DD BOARD
no mark : REC/PB mode
( ) : REC mode
< > : PB mode
J901
BATTERY TERMINAL
F450 1.6A 125V
F451 1.6A 125V
F452 1.6A 125V
CL902
CL903
CL936
CL909
CL908
CAM-UNREG
MT-UNREG
VTR-UNREG
C912 33 10V :WF
CL906 CL907
CL901 CL935
*
FX530 | D902E MA4Z082 | J903E ST | R933E 0
FX630/430/435 | D902F XX | J903F MONO | R933F XX
LND903
LND902
LND901
IC901
DC/DC CONVERTER PWM DRIVE
IC901 MB3759-02-ER
VREF
VCC1
PWR ON
ABCDE-ON
F-ON
SCP
CS
VCC2
GND
VCC3
OSC
ERR2
ERR1
(C-8) Q905 5V SWITCH
Q905 FP101-TL
(D-9) Q907 CAPSTAN PWM DRIVE
(C-9) Q906 DRUM PWM DRIVE
Q907 FP101-TL
Q906 FP101-TL
L903 10µH
L908 22µH
L907 22µH
L906 47µH
CL916 CL918
CL914 CL919
CL915 CL917
DRUM-VS
CAP-VS
MT5V
Q902 (B-9) SWITCHING
Q902 2SB1122-ST-TD
T901 TRANSFORMER
D901 MA796-TX
(A-6) Q915 DETECT
Q915 UN5213-TX
Q901 (B-7) 15V, -8.5V SWITCH
Q901 XN4213-TW
D909 MA111-TX
Q914 UN5213-TX
Q909 2SB1121-ST-TD
(B-7) Q909 CAM5V SWITCH
Q914 (C-7) EMERGENCY DETECT SWITCH
(B-8) Q903 3.6V SWITCH
Q903 FP101-TL
(C-10) (C-9) Q911, 912 DETECT
Q912 2SB1218
Q911 UN5213
(C-8) Q904 5V SWITCH
Q904 FP102-TL
L901 10µH
L905 22µH
L904 47µH
L913 4.7µH 3225 :NLC
L912 4.7µH 3225 :NLC
L911 4.7µH 3225 :NLC
L910 4.7µH 3225 :NLC
L909 4.7µH 3225 :NLC
L915 100µH 3225 :NLC
L914 100µH 3225 :NLC
L916 4.7µH 3225 :NLC
L917 4.7µH 3225 :NLC
CL900
CL940
CL904
CL905
CL950
CL910 CL912
CL911
CL913
CL920
CL921 CL927
CL933 CL934
CL938 CL939
CL926 CL932
CL925 CL931
CL924 CL930
CL923 CL929
CL922 CL928
CAM15V
EVF15V
CAM-8.5V
CAM5V
D5V
EVF5V
V15V
AU5V
RP5V
ON1
ON2
HP R
HP L
HP GND
LANC
J902
PHONES
J903
D902 (B-10) MA4Z082
(A-10) D910 MA111-TX
D900 (B-10) MA4Z082
R921 0 1/8W
R924 0
R923 0 1/8W
R932 0
R933
R936 0
CN901 42P :B-TO-B (D-6)
42 HP R OUT
41 HP L OUT
40 LANC DC
39 HP GND
38 LANC SIG
37 CAM D/D ON
36 VTR D/D ON
35 DRUM ERR
34 CAP ERR
33 EVF 5V
32 EVF 15V
31 EVF UNREG
30 EVF UNREG GND
29 AU 5V
28 VTR UNREG
27 SS 3.6V
26 REG GND
25 CAM -9V
24 REG GND
23 D 5V
22 REG GND
21 CAM 15V
20 CAM 5V
19 CAM 5V
18 VID 5V
17 VID 5V
16 D3.6V
15 D3.6V
14 R/P 5V
13 MT5V
12 MT5V
11 DRUM VS
10 DRUM VS
9 CAP VS
8 CAP VS
7 MOTOR UNREG
6 MT UNREG GND
5 MOTOR UNREG
4 MT UNREG GND
3 MT5V (FOR MD3.6V)
2 MT UNREG GND
1 RFU DC OUT
TO VS BOARD (4/5) CN504
(See Page 4-34)
09

— Ref. No. DD BOARD: 9000 series —

J

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safty.
Replace only with part number specified.

Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

- SIGNAL PATH

	AUDIO SIGNAL
REC	
PB	⇨

- SIGNAL PATH

	REC	REC/PB	PB
Drum servo (speed and phase)		⋙	
Capstan servo (speed and phase)		⋙	

SECTION 5

REPAIR PARTS LIST

5-1. EXPLODED VIEWS

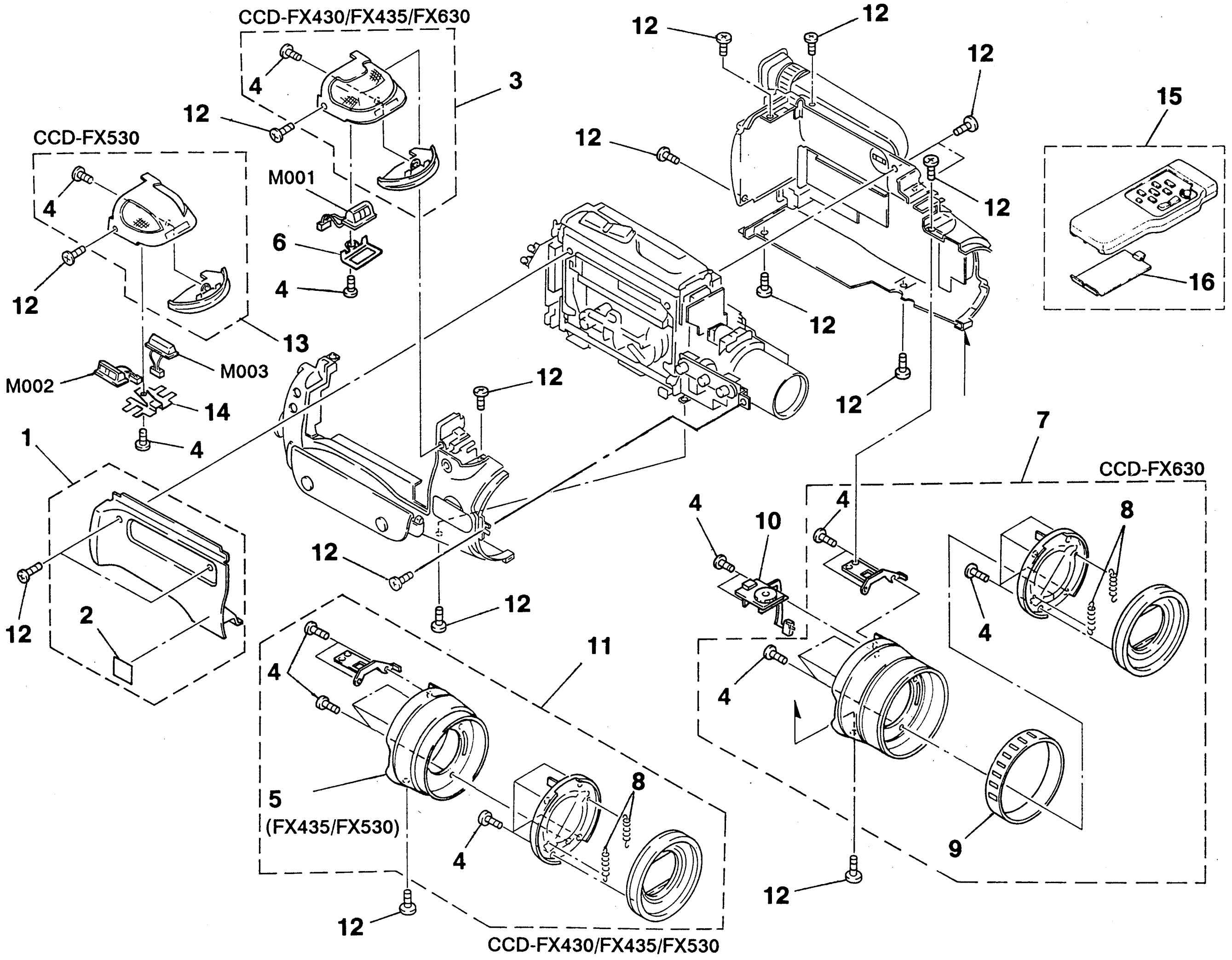
NOTE:

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ∗ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Hardware (# mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

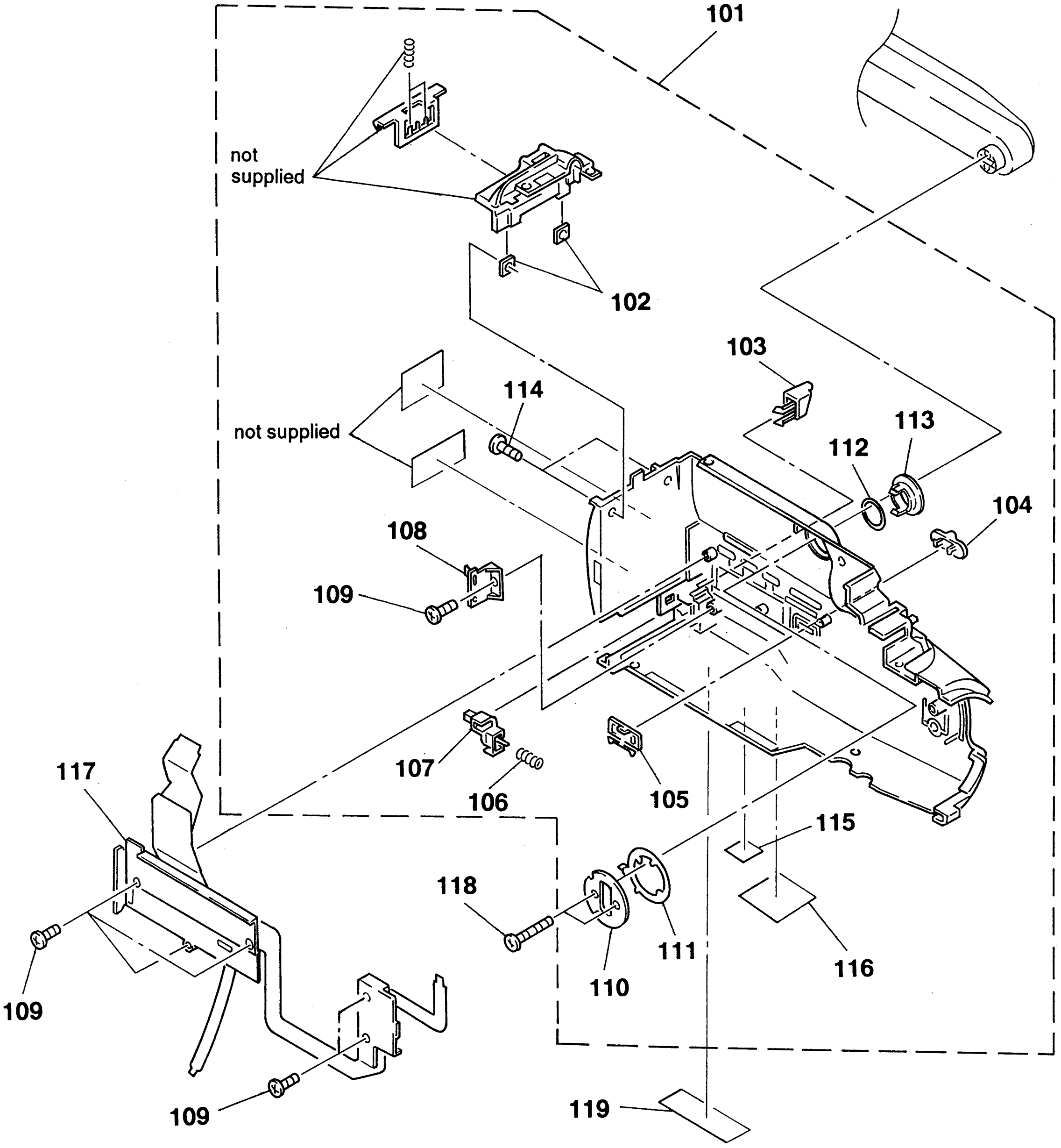
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

5-1-1. FRONT CASE BLOCK ASSEMBLY



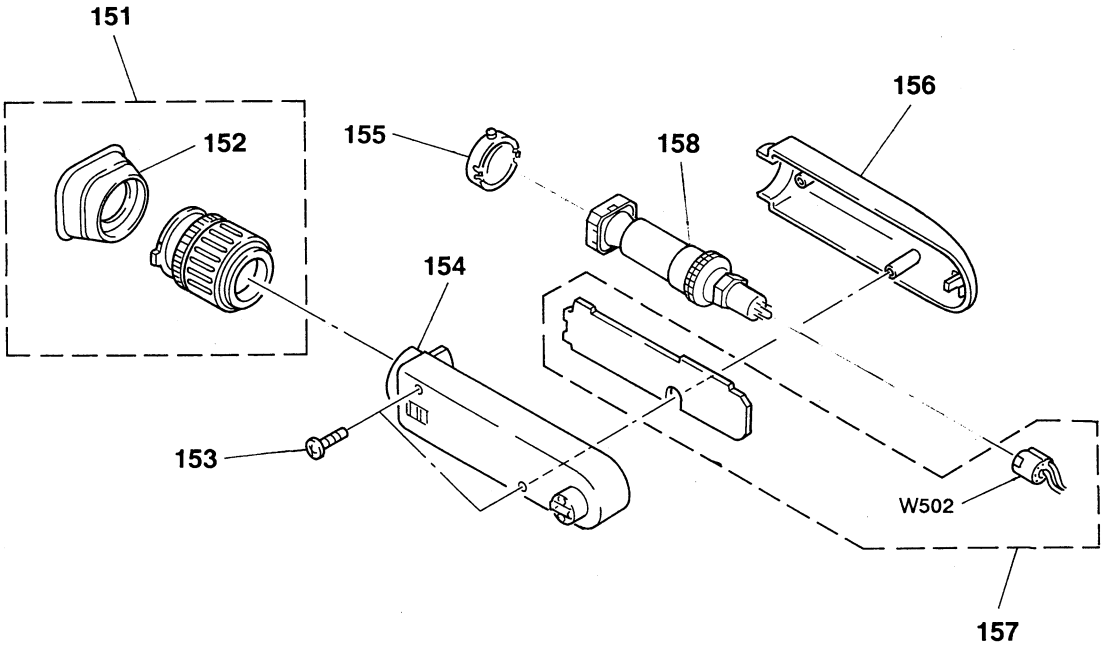
Ref.No.	Part No.	Description	Remark
1	X-3943-845-1	LID ASSY, CASSETTE (FX630)	
1	X-3943-858-1	LID ASSY, CASSETTE (FX430)	
1	X-3943-987-1	LID ASSY, CASSETTE (FX435)	
1	X-3943-994-1	LID ASSY, CASSETTE (FX530)	
2	3-703-710-41	STICKER, SONY SYMBOL (12)	
3	X-3943-847-1	HOLDER(M)ASSY, MICROPHONE (FX435/FX630)	
3	X-3943-856-1	HOLDER (M) ASSY, MICROPHONE (FX430)	
4	3-948-339-01	SCREW (BTP)(2X5), HEAD	
5	X-3943-992-1	FRONT (L) ASSY (FX435/FX530)	
∗ 6	3-958-672-01	PLATE, FIXED (W), MICROPHONE (FX430/FX435/FX630)	
7	A-7082-585-A	CASE BLOCK ASSY, FRONT (FX630)	
8	3-570-776-01	SPRING, TENSION	
9	3-958-329-01	RUBBER, MF (FX630)	
10	1-467-647-11	SWITCH BLOCK, CONTROL (F-VR)(FX630)	
11	A-7082-588-A	CASE (LL) BLOCK ASSY, FRONT (FX430)	
11	A-7082-608-A	CASE (L) BLOCK ASSY, FRONT(FX435/FX530)	
12	3-719-381-01	SCREW (M2X4)	
13	X-3943-993-1	HOLDER (S) ASSY, MICROPHONE (FX530)	
∗ 14	3-958-944-01	PLATE, FIXED, MICROPHONE (FX530)	
15	1-467-574-21	REMOTE COMMANDER (RMT-708)	
16	3-958-131-01	LID, BATTERY CASE (for RMT-708)	
M001	1-542-162-11	MICROPHONE UNIT (FX430/FX435/FX630)	
M002	1-542-186-21	MICROPHONE UNIT (FX530)	
M003	1-542-186-21	MICROPHONE UNIT (FX530)	

5-1-3. CABINET (R) BLOCK ASSEMBLY



Ref. No.	Part No.	Description	Remark
101	X-3943-853-1	CABINET (R) ASSY (M)(FX630)	
101	X-3943-861-1	CABINET (R) ASSY (LL)(FX430)	
101	X-3943-988-1	CABINET (R) ASSY (LLD)(FX435)	
101	X-3943-995-1	CABINET (R) ASSY (L)(FX530)	
102	3-718-233-01	NUT, PLATE	
103	3-958-320-01	BUTTON, BATTERY RELEASE (FX435/FX530/FX630)	
103	3-958-320-11	BUTTON, BATTERY RELEASE (FX430)	
104	3-958-294-01	BUTTON, ST (FX630)	
105	3-958-295-01	RETAINER, ST BUTTON (FX630)	
106	3-426-508-00	SPRING, COMPRESSION	
107	3-958-321-01	CLAW (LOWER), BATTERY LOCK	
108	3-958-322-01	HOLDER, BATTERY LOCK	
109	3-948-339-01	SCREW (BTP)(2X5), HEAD	
* 110	3-958-297-01	PLATE, LOCK, TILT	
* 111	3-958-296-01	SPRING, PLATE, TILT	
112	3-747-112-01	RING, TILT	
113	3-747-109-01	SLEEVE, EVF	
114	3-719-381-01	SCREW (M2X4)	
115	3-704-256-01	LABEL, CAUTION	
116	3-957-897-01	LABEL, FAROUDJA RECYCLE FCC	
117	1-467-648-11	SWITCH BLOCK, CONTROL (CK)(FX630)	
117	1-467-648-21	SWITCH BLOCK, CONTROL (CK) (FX430/FX435/FX530)	
118	3-740-546-51	SCREW (M2X9)	
* 119	3-958-308-01	LABEL, MODEL NUMBER (630)(FX630)	
* 119	3-958-353-01	LABEL, MODEL NUMBER (430)(FX430)	
* 119	3-958-943-01	LABEL, MODEL NUMBER (435)(FX435)	
* 119	3-958-945-01	LABEL, MODEL NUMBER (530)(FX530)	

5-1-4. EVF BLOCK ASSEMBLY

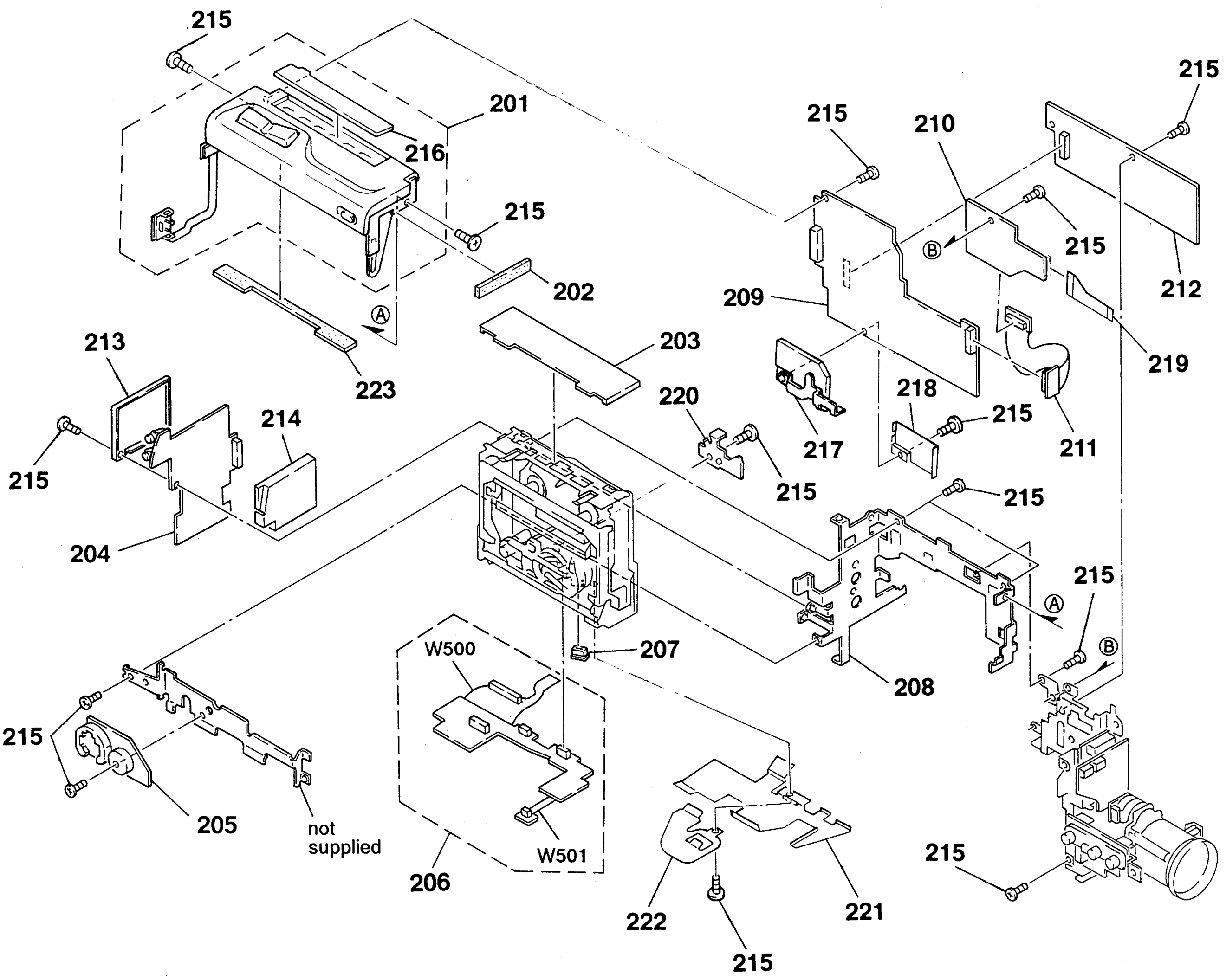


The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

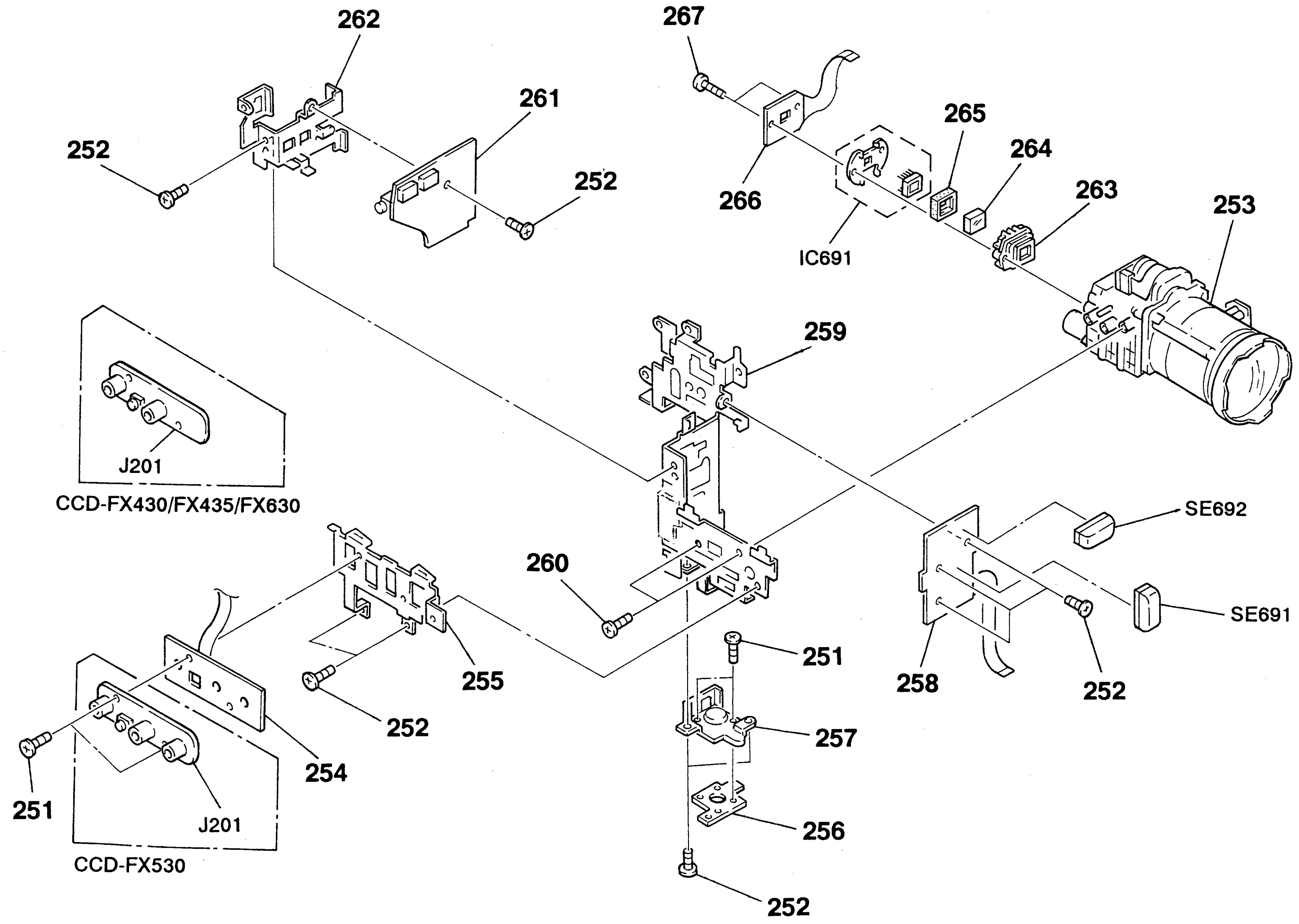
Ref. No.	Part No.	Description	Remark
151	A-7081-897-C	HOLDER BLOCK ASSY, FINDER	
152	3-946-212-01	EYE CUP	
153	3-713-790-31	SCREW (M2X8), TAPPING, P3	
154	X-3943-848-1	CABINET(L)ASSY, EVF (FX435/FX530/FX630)	
154	X-3943-857-1	CABINET (L) ASSY, EVF (FX430)	
155	A-7081-905-E	LENS ASSY, VF	
156	X-3943-844-1	CABINET(R)ASSY, EVF (FX435/FX530/FX630)	
156	X-3943-854-1	CABINET (R) ASSY, EVF (FX430)	
* 157	A-7063-947-A	VF-44 BOARD, COMPLETE	
⚠158	1-452-566-11	CRT ASSY (M01KKX07WB10)	
W502	1-526-978-51	SOCKET ASSY, CRT	

5-1-5. MAIN BOARDS ASSEMBLY



Ref. No.	Part No.	Description	Remark
201	1-467-649-11	SWITCH BLOCK, CONTROL (FK) (FX435/FX530/FX630)	
201	1-467-649-21	SWITCH BLOCK, CONTROL (FK)(FX430)	
202	3-959-113-01	CUSHION, FK FRAME	
203	3-958-341-01	COVER, LS	
* 204	A-7063-946-A	DD-64 BOARD, COMPLETE (FX430/FX435/FX630)	
* 204	A-7063-983-A	DD-65 BOARD, COMPLETE (FX530)	
* 205	A-7072-002-A	ZB-2 BOARD, COMPLETE	
* 206	A-7072-000-A	SL-38 BOARD, COMPLETE	
207	1-691-471-11	CONNECTOR, TRANSLATION 11P	
* 208	3-958-345-01	FRAME (U)	
* 209	A-7063-944-A	VS-110 BOARD, COMPLETE (FX430/FX435/FX630)	
* 209	A-7063-982-A	VS-111 BOARD, COMPLETE (FX530)	
* 210	A-7063-943-A	AU-157 BOARD, COMPLETE (FX430/FX435/FX630)	
* 210	A-7063-981-A	AU-168 BOARD, COMPLETE (FX530)	
211	1-651-935-11	FP-95 FLEXIBLE BOARD(FX430/FX435/FX630)	
211	1-652-452-11	FP-166 FLEXIBLE BOARD (FX530)	
* 212	A-7063-945-A	VC-143 BOARD, COMPLETE (FX630)	
* 212	A-7063-949-A	VC-143 BOARD, COMPLETE (FX430/FX435)	
* 212	A-7063-984-A	VC-142 BOARD, COMPLETE (FX530)	
* 213	3-958-925-01	CASE (MAIN), SHIELD, DD	
* 214	3-958-926-01	CASE (LID), SHIELD, DD	
215	3-713-786-81	SCREW (M2X3)	
216	3-958-720-01	LID (FX435/FX530/FX630)	
216	3-958-720-11	LID (FX430)	
* 217	X-3943-976-1	SHIELD (MAIN) ASSY, RP	
* 218	3-958-924-01	CASE (LID), SHIELD, RP	
219	1-651-936-11	FP-96 FLEXIBLE BOARD(FX430/FX435/FX630)	
219	1-652-453-11	FP-176 FLEXIBLE BOARD (FX530)	
* 220	3-958-667-01	FRAME (B)	
* 221	3-958-928-01	PLATE, SHIELD, RP	
222	1-651-891-11	FP-52 FLEXIBLE BOARD	
223	3-958-719-01	CUSHION, FK	
W500	1-651-889-11	FP-48 (SL) FLEXIBLE BOARD	
W501	1-642-186-11	FP-437 FLEXIBLE BOARD	

5-1-6. CCD BLOCK ASSEMBLY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IC691
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J201
CCD-FX430/FX435/FX630
SE692
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SE691
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J201
256
CCD-FX530
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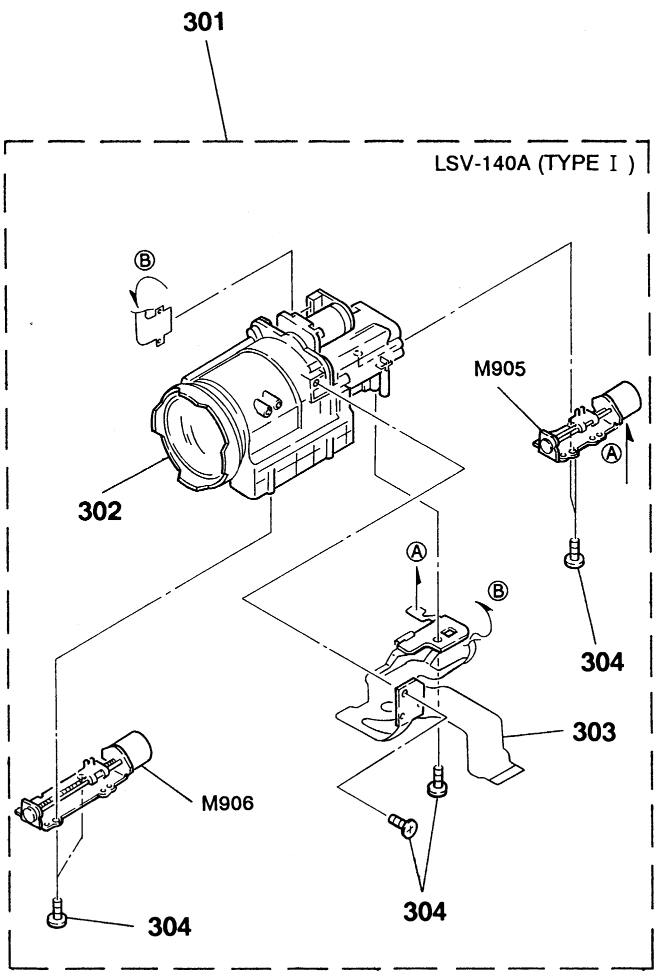
Be sure to read "Note on the CCD Imager replacement" on page 4—6 when changing the CCD imager.

Ref. No.	Part No.	Description	Remark
251	3-719-381-01	SCREW (M2X4)	
252	3-713-786-81	SCREW (M2X3)	
253	1-547-716-11	LENS, ZOOM (VCL-5412WA)(TYPE II)	
253	8-848-704-01	DEVICE, LENS (LSV-140A)(TYPE I)	
254	1-651-904-11	FP-97 FLEXIBLE BOARD	
* 255	3-958-333-01	FRAME (PJ)	
256	3-958-286-01	SHEET METAL, TRIPOD	
257	3-958-310-01	HOLDER, TRIPOD	
258	1-651-890-11	FP-49 FLEXIBLE BOARD	
* 259	X-3944-147-1	FRAME (L) ASSY	
260	3-948-339-01	SCREW (BTP)(2X5), HEAD	
* 261	A-7063-941-A	MA-197 BOARD, COMPLETE (FX430/FX435/FX630)	
* 261	A-7063-980-A	MA-198 BOARD, COMPLETE (FX530)	
* 262	3-958-328-01	FRAME (MA)	
263	3-946-856-01	ADAPTOR (H), CCD FITTING	
264	1-542-186-21	MICROPHONE UNIT (FX530)	
264	1-547-558-21	FILTER BLOCK, OPTICAL (FX430/FX435/FX530)	
265	3-946-857-01	RUBBER (S), SEAL	
* 266	A-7071-996-A	FP-46 (CD) BOARD, COMPLETE (FX630)	
* 266	A-7072-003-A	FP-46 (CD) BOARD, COMPLETE (FX430/FX435/FX530)	
267	3-947-268-01	SCREW (B TIGHT)(2), TAPPING	
IC691	A-7030-368-A	CCD BLOCK ASSY(AUTO)(054 SERVICE) (CCD IMAGER)(FX430/FX435/FX530)	
IC691	A-7030-373-A	CCD BLOCK ASSY(AUTO)(059V SERVICE) (CCD IMAGER)(FX630)	
J201	1-537-415-11	TERMINAL BOARD (FX530)	
J201	1-537-726-11	TERMINAL BOARD (FX430/FX435/FX630)	
SE691	1-810-024-31	SENSOR, ANGULAR VELOCITY	
SE692	1-810-024-41	SENSOR, ANGULAR VELOCITY	

5-1-7. ZOOM LENS ASSEMBLIES (LSV-140A) (VCL-5412WA)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LSV-140A (TYPE I)
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M905
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M906
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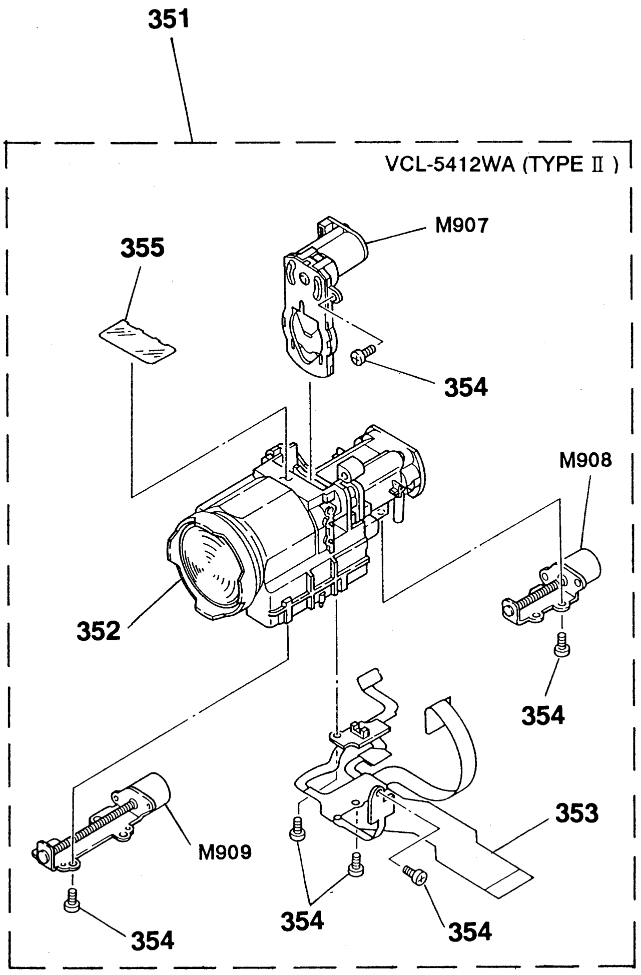
351
VCL-5412WA (TYPE II)
M907
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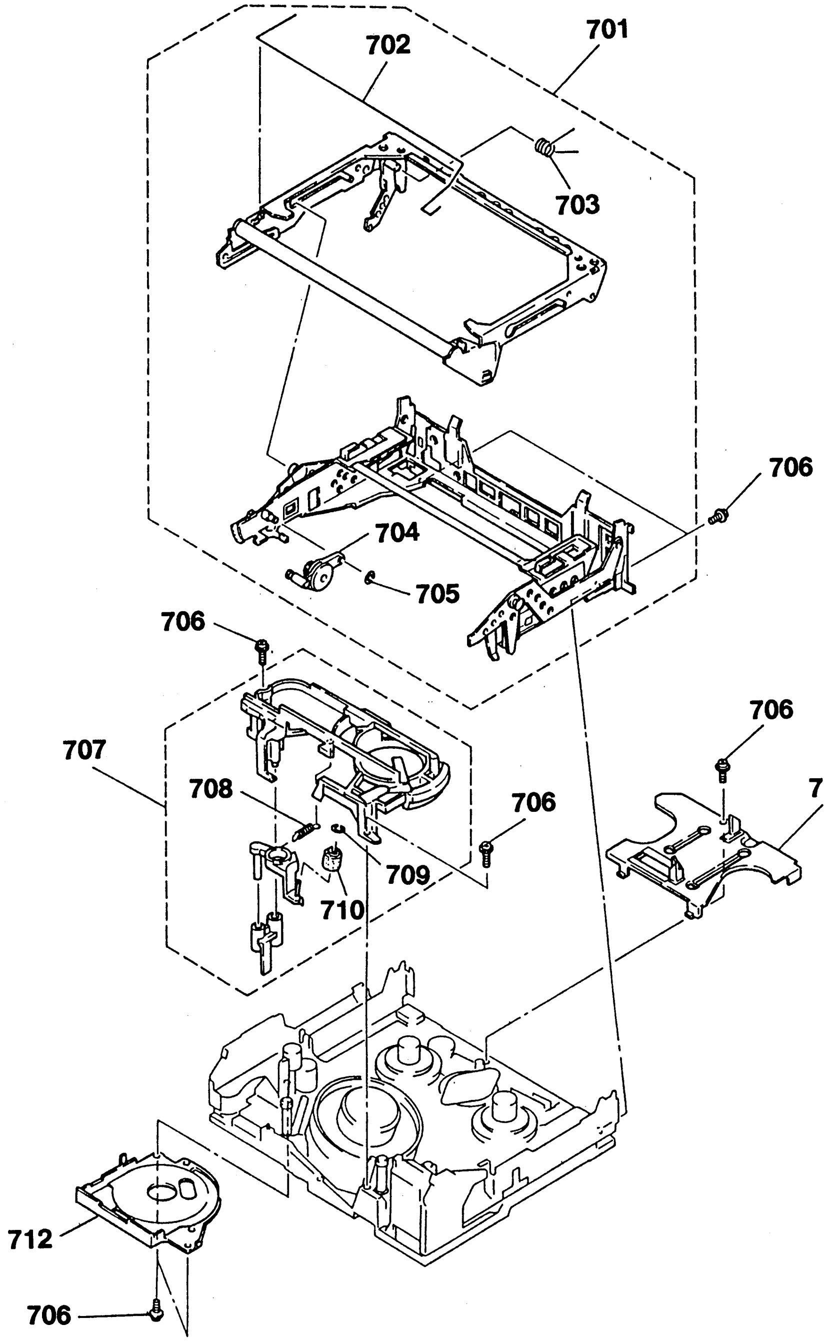
Ref. No.	Part No.	Description	Remark
301	8-848-704-01	DEVICE, LENS (LSV-140A)(TYPE I)	
302	A-4910-598-A	DEVICE ASSY, LSV-140A (RP)	
303	A-4915-338-A	FLEXIBLE, MOUNT	
304	3-713-791-41	SCREW (M1.7X5), TAPPING, P2	
M905	1-698-364-01	MOTOR ASSY, FOCUS	
M906	1-698-363-01	MOTOR ASSY, ZOOM	
351	1-547-716-11	LENS, ZOOM (VCL-5412WA)(TYPE II)	

Ref. No.	Part No.	Description	Remark
352	3-708-891-01	DEVICE ASSY	
353	3-708-890-01	FLEXIBLE BOARD, MAIN	
354	3-708-302-01	SCREW (BT3 P1.7X4C)	
355	3-708-886-01	COVER, IG	
M907	3-708-888-01	METER, IG	
M908	3-708-889-01	MOTOR ASSY, FOCUS	
M909	3-708-887-01	MOTOR ASSY, ZOOM	

5-1-8. CASSETTE COMPARTMENT ASSEMBLY



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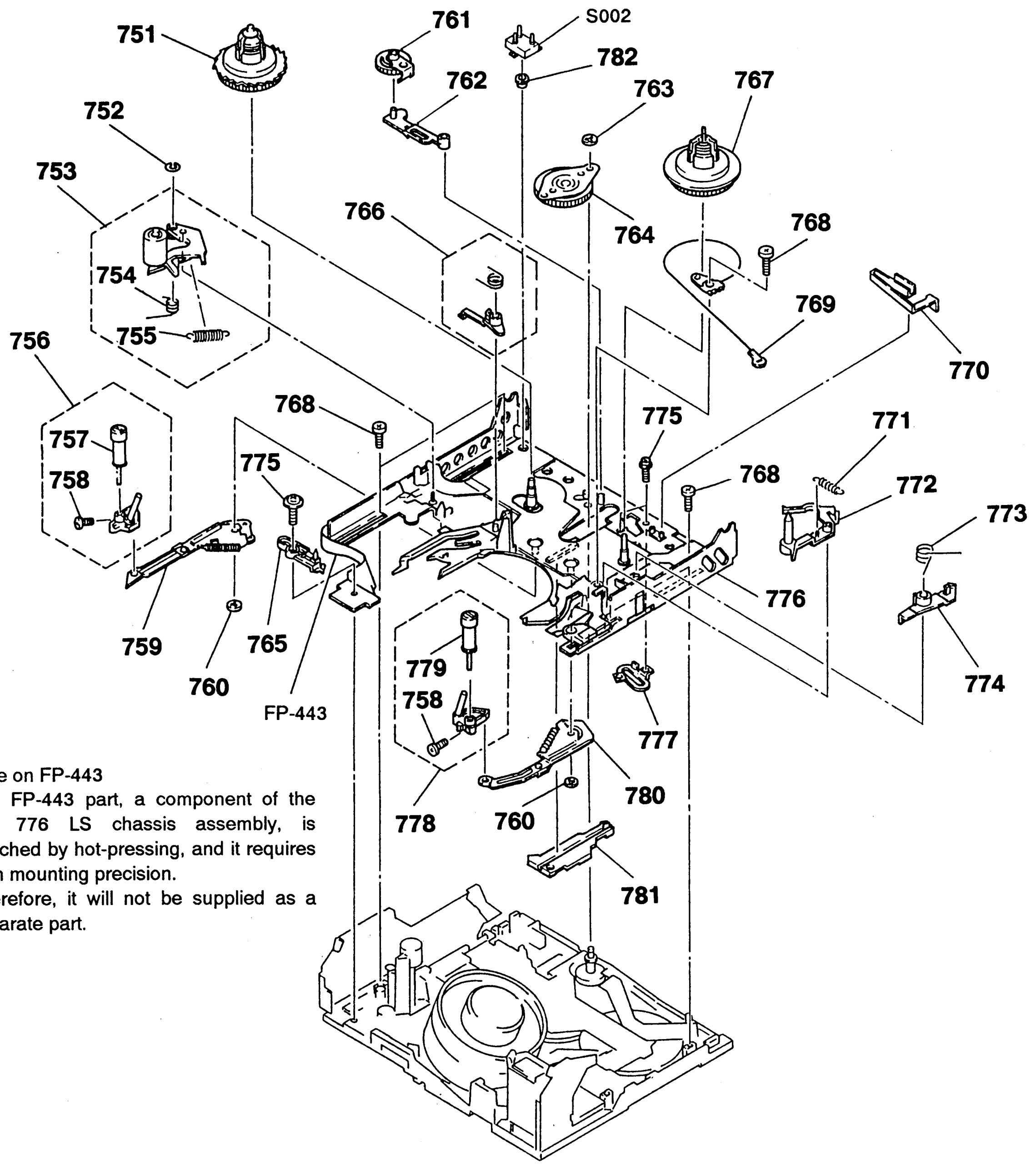
Ref. No.	Part No.	Description	Remark
701	A-7040-312-K	CASSETTE COMPARTMENT BLOCK ASSY	
702	3-945-773-01	BAR, TORSION	
703	3-945-771-01	SPRING, TORSION	
704	X-3941-287-2	DAMPER ASSY	
705	3-315-384-31	WASHER, STOPPER	
706	3-947-503-01	SCREW (M1.4X2.5)	

Ref. No.	Part No.	Description	Remark
707	A-7040-309-A	PROTECT (BASE) BLOCK ASSY	
708	3-945-760-01	SPRING, TENSION	
709	3-321-393-01	WASHER, STOPPER	
710	X-3166-813-1	ROLLER ASSY, HC	
711	X-3941-280-1	RETAINER ASSY, GOOSENECK	
712	3-945-733-01	COVER, CAPSTAN	

5-1-9. LS CHASSIS ASSEMBLY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S002
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FP-443
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Note on FP-443
The FP-443 part, a component of the No. 776 LS chassis assembly, is attached by hot-pressing, and it requires high mounting precision.
Therefore, it will not be supplied as a separate part.

Ref. No.	Part No.	Description	Remark
751	X-3941-274-1	TABLE ASSY, REEL, T	
752	3-331-007-21	WASHER	
753	X-3941-271-5	ARM ASSY, PINCH	
754	3-945-743-01	SPRING, TORSION	
755	3-945-783-01	SPRING, TENSION	
756	A-7040-307-A	GUIDE (BASE)(T) BLOCK ASSY	
757	X-3941-424-1	ROLLER ASSY, TG6	
758	3-947-504-01	SCREW (M1.2X2)	
759	X-3941-267-1	ARM (T) ASSY, GUIDE	
760	3-669-465-00	WASHER (1.5), STOPPER	
761	X-3941-273-1	SOFT ASSY, T	
762	3-945-753-01	ARM, T SOFT	
763	3-726-829-01	WASHER, STOPPER	
764	X-3941-279-5	GEAR ASSY, GOOSENECK	
765	3-947-644-01	RETAINER, TG5 (BASE)	
766	A-7040-321-A	CLAW BLOCK ASSY, T HARD	
767	X-3943-676-1	TABLE ASSY, S REEL	
768	3-945-756-01	SCREW (M1.4X3)	
769	X-3941-277-1	STRING BLOCK ASSY	
770	3-945-801-01	BRAKE, S SOFT	
771	3-954-327-01	SPRING, TENSION	
772	X-3941-276-1	TG1 ASSY	
773	3-945-752-01	SPRING, TORSION	
774	3-945-799-01	BRAKE, S HARD	
775	3-947-503-01	SCREW (M1.4X2.5)	
776	X-3943-307-1	CHASSIS ASSY, LS	
777	3-945-784-01	PLATE, CAM, LS	
778	A-7040-306-A	GUIDE (BASE)(S) BLOCK ASSY	
779	X-3941-269-1	ROLLER ASSY, TG3	
780	X-3941-266-1	ARM (S) ASSY, GUIDE	
781	3-945-837-01	SLIDER, GL	
782	3-949-881-01	SLEEVE	
S002	1-572-987-11	SWITCH, PUSH (3 KEY) (REC PROOF, ME/MP, MP/MP-HG)	

SECTION 6
INTERFACES • IC PIN

6-1. CAMERA CONTROL MICRO PROCESSOR PIN FUNCTION (VC BOARD IC602: SC424608 MC68HC11MA8FU)

Pin No.	Signal Name	I/O	Function
1	VTR SI	I	Serial data input from mode control microprocessor (VS board IC503).
2	$\overline{\text{VTR SCK}}$	I	Serial data transfer clock from/to mode control microprocessor.
3	$\overline{\text{CAM CS}}$	I	Chip select signal from mode control microprocessor.
4			Not used.
5			
6			
7			
8			
9	PBV	I	V sync signal from servo/mechanism control microprocessor (VS board IC505).
10			Not used (connected to +3.6V).
11			
12	VDD		+3.6V power supply.
13	VSS		GND
14	$\overline{\text{CS TG}}$	O	Chip select signal to timing generator (IC702).
15			Not used (connected to +3.6V).
16	START	O	Operation signal of IC705. Normally "L". "H" during operation.
17	WEN	I	Write enable signal from timing generator (IC702). Normally "H".
18			Not used.
19	$\overline{\text{CS VISTA}}$	O	Chip select signal to steady shot control microprocessor (IC777).
20	$\overline{\text{CS CORE}}$	O	Chip select signal to camera core (IC609).
21	EEPROM BUSY	I	BUSY signal from EEPROM (IC601). Normally "H". "L" during data read/write.
22			Not used.
23	IRIS PWM	O	Iris control signal.
24			Not used.
25			
26	$\overline{\text{TESTX}}$	O	Test signal of IC705. "H": Camera mode, "L": Test/VTR mode.
27	LENS RST LED	O	Lens reset sensor LED ON/OFF. "H": ON, "L": OFF.
28	FC RST	I	Lens focus reset sensor signal input.
29	ZM RST	I	Lens zoom reset sensor signal input.
30	XIRQ		Connected to +3.6V.
31	VDD		+3.6V power supply.
32	VSS		GND
33			Not used.
34			
35			
36	$\overline{\text{CAM SCK}}$	O	Serial data transfer clock.
37	CAM SO	O	Serial data output.
38	CAM SI	I	Serial data input.
39			Not used.
40			
41	VDD		+3.6V power supply.
42	GENERAL A/D	I	Camera core (IC609) discrimination signal input.
43	LENS TYPE	I	Lens type discrimination signal input.
44	ZOOM SW	I	Zoom key signal input. When not pressed: 1.8V, TELE 1: 2.7V, TELE 2: 3.6V, WIDE 1: 0.9V, WIDE 2: 0V.
45	MAN FOCUS (2)	I	Manual focus dial signal (2) input. 0V to 3.4V depending on the dial turning.
46	MAN FOCUS (1)	I	Manual focus dial signal (1) input. 0V to 3.4V depending on the dial turning.
47			Not used. Connected to GND.
48			
49	HALL A/D	I	Hall voltage. Approx. 1V (iris opened) to approx. 3.5V (iris closed).
50	VRL	I	Connected to GND.
51	VRH	I	Connected to +3.6V.
52	VSS		GND
53	$\overline{\text{CS EEPROM}}$	O	Chip select signal to EEPROM (IC601).
54	$\overline{\text{CS CAM OPD}}$	O	Chip select signal to OPD (IC611).
55	D/A STB	O	Strobe signal to camera EVR (IC603).
56	$\overline{\text{EEPROM RESET}}$	O	EEPROM (IC601) write disable signal. Normally "H".
57	$\overline{\text{CS AF OPD}}$	O	Chip select signal to AF OPD (IC611).
58	$\overline{\text{CS PDR}}$	O	Chip select signal to pre-driver (IC753).
59	$\overline{\text{CAM ON}}$	O	A/D converter (IC704) ON/OFF signal. Normally "H".
60	$\overline{\text{NTSC}}$	O	"L": NTSC, "H": PAL.
61	IRQ	I	Connected to +3.6V.
62			Not used.
63			
64	$\overline{\text{PDR RST}}$	O	Reset signal to zoom/focus pre-driver (IC753). "H": Camera mode, "L": VTR mode.
65	$\overline{\text{NRML/VST}}$	O	"H": Steady shot operation, "L": Normal operation.
66	$\overline{\text{VST/CORE RST}}$	O	Reset signal to steady shot control microprocessor (IC777) and camera core (IC609). Normally "H". "L": Reset.
67	$\overline{\text{OPD RST}}$	O	Reset signal to IC611 and IC705. "H": Camera mode, "L": VTR mode.
68			Not used. Connected to GND.
69			
70	VSS		GND
71	VDD		+3.6V power supply.
72			Not used.
73	EXTAL	I	24 MHz clock oscillation circuit.
74	XTAL	O	
75	$\overline{\text{RESET}}$	I	Reset signal from mode control microprocessor (VS board IC503). Normally "H". "L": Reset.
76	MODB		Connected to +3.6V.
77	MODA		Connected to GND.
78	RXD		Not used.
79	TXD		
80	VTR SO	O	Serial data output to mode control microprocessor (VS board IC503).

6-2. STEADY SHOT CONTROL MICRO PROCESSOR PIN FUNCTION (VC BOARD IC777: CXP87132-010R) (CCD-FX630)

Pin No.	Signal Name	I/O	Function
1	MPX	O	Not used.
2	$\overline{\text{ADC STBY}}$	O	Standby output to A/D converter (IC776). Normally "H".
3	C RESET	O	Reset signal to PITCH/YAW sensor amplifier (IC772 to IC774) in initializing. Normally "L".
4	PB0/PPO8	O	Not used.
5	PC7/RTO7	O	
6	PC6/RTO6	O	
7	PC5/RTO5	O	
8	PC4/RTO4	O	
9	PC3/RTO3	O	
10	PC2/PPO18	O	
11	PC1/PPO17	O	
12	PC0/PPO16	O	
13	PJ7	O	
14	PJ6	O	
15	PJ5	O	
16	PJ4	O	
17	PJ3	O	
18	PJ2	O	
19	PJ1	O	
20	PJ0	O	
21	PD7	O	
22	PD6	O	
23	PD5	O	
24	PD4	O	
25	PD3	O	
26	PD2	O	
27	PD1	O	
28	PD0	O	
29	PH7	O	
30	PH6	O	
31	PH5	O	
32	PH4	O	
33	PH3	O	
34	PH2	O	
35	PH1	O	
36	PH0	O	
37	MP	I	Connected to GND.
38	$\overline{\text{VST RST}}$	I	Reset signal from camera microprocessor (IC602). Normally "H".
39	VSS		GND. Connected to GND.
40	XTAL	O	Connected to 12 MHz crystal oscillator.
41	EXTAL	I	Connected to 12 MHz crystal oscillator.
42	$\overline{\text{CS VISTA MICOM}}$	I	Chip select signal from camera microprocessor (IC602).
43	S IN	I	Serial data input from camera microprocessor (IC602).
44	S OUT	O	Serial data output to camera microprocessor (IC602).
45	$\overline{\text{CAM SCK}}$	I	Serial data transfer clock from/to camera microprocessor (IC602).
46	PF7/AN11	O	Not used.
47	PF6/AN10	O	
48	PF5/AN9	O	
49	PF4/AN8	O	
50	AVSS		A/D port GND. Connected to GND.
51	AVREF	I	A/D port reference voltage input. Connected to +3.6V.
52	AVDD		A/D port positive power supply. Connected to +3.6V.
53	PF3/AN7	I	Not used. Connected to +3.6V.
54	PF2/AN6	I	
55	PF1/AN5	I	
56	PF0/AN4	I	
57	AN3	I	
58	AN2	I	
59	AN1	I	
60	AN0	I	
61	PG7/EX11	I	Not used. Connected to GND.
62	CGV	I	V SYNC from sync generator (IC601).
63	FLD	I	FLD signal from sync generator (IC601).
64	PG4/SYNC0	I	Not used. Connected to GND.
65	PG3//PBCTL	I	
66	PG2/DPG	I	
67	PG1/DFG	I	
68	PG0/CFG	I	
69	PE7/DAB1	O	Not used.
70	PE6/DAB0	O	
71	PE5/DAA1	O	
72	PE4/DAA0	O	
73	PE3/PWM1	O	
74	PE2/PWM0	O	
75	PE1//INT2	I	Not used. Connected to +3.6V.
76	PE0//INT0	I	
77	VST SI	I	Serial data input.
78	VST SO	O	Serial data output.
79	/VST SCK	O	Serial data transfer clock.
80	PI4//INT1	O	Not used.

Pin No.	Signal Name	I/O	Function
81	PI3/T0	O	Not used.
82	PI2//PWM	O	
83	PI1/P0	O	
84	PI0/PCK	I	Not used. Connected to +3.6V.
85	PKO	I	
86	GND		GND
87	VDD		+3.6V power supply.
88	VPP		Connected to +3.6V.
89	(/CS_DISP)	O	Not used.
90	PA6/PPO6	O	
91	/CS_ADC	O	Chip select signal to A/D converter (IC776).
92	/CS_ZTG	O	Chip select signal to timing generator (IC702).
93	/CS_ZVST	O	Chip select signal to IC613.
94	PA2/PPO2	O	Not used.
95	PA1/PPO1	O	
96	PA0/PPO0	O	
97	PB7/PPO15	O	
98	PB6/PPO14	O	
99	PB5/PPO13	O	
100	PB4/PPO12	O	

6-3. CAMERA CORE PIN FUNCTION (VC BOARD IC609: CXD2150R-T6)

Pin No.	Signal Name	I/O	Function	
1	OPD6	O	OPD (IC611) data output.	
2	OPD5	O	OPD data output.	
3	OPD4	O	OPD data output.	
4	OPD3	O	OPD data output.	
5	OPD2	O	OPD data output.	
6	OPD1	O	OPD data output.	
7	OPD0	O	OPD data output, LSB.	
8	OPDID	O	OPD line discrimination signal.	
9	VDD	–	Power supply (+3.6V).	
10	CO3	O	C signal output, MSB (CCD-FX630).	
11	CO2	O	C signal output (CCD-FX630).	
12	CO1	O	C signal output (CCD-FX630).	
13	CO0	O	C signal output, LSB (CCD-FX630).	
14	VSS	–	GND	
15	CI3	I	C signal input, MSB (CCD-FX630).	
16	CI2	I	C signal input (CCD-FX630).	
17	CI1	I	C signal input (CCD-FX630).	
18	CI0	I	C signal input, LSB (CCD-FX630).	
19	NRB	O	C signal. Color discrimination signal.	
20	VDD	–	+3.6V power supply.	
21	VBC		Connected to GND via 0.1 μF capacitor.	Chroma signal D/A converter interface.
22	AVSC		GND	
23	IREFC		Connected to GND via 12 kΩ resistor.	
24	VREFC	I	Full scale output value setting voltage.	
25	VGC		Connected to +3.6V power supply via 0.1 μF capacitor.	
26	AVDC		+3.6V power supply.	
27	IOC	O	Chroma signal output (Current output).	
28	VDD	–	Y I/F power supply (+3.6V).	
29	DICK	O	Memory interface reference clock (CCD-FX630).	
30	CDIS	O	Digital output (chroma) color discrimination signal (CCD-FX630).	
31	YO7	O	Y signal output, MSB (CCD-FX630).	
32	YO6	O	Y signal output (CCD-FX630).	
33	YO5	O	Y signal output (CCD-FX630).	
34	YO4	O	Y signal output (CCD-FX630).	
35	YO3	O	Y signal output (CCD-FX630).	
36	YO2	O	Y signal output (CCD-FX630).	
37	YO1	O	Y signal output (CCD-FX630).	
38	YO0	O	Y signal output, LSB (CCD-FX630).	
39	DATS	I	DA test pin. (Normally fixed at "L".)	
40	YI7	I	Y signal input, MSB (CCD-FX630).	

Pin No.	Signal Name	I/O	Function	
41	Y16	I	Y signal input (CCD-FX630).	
42	Y15	I	Y signal input (CCD-FX630).	
43	Y14	I	Y signal input (CCD-FX630).	
44	Y13	I	Y signal input (CCD-FX630).	
45	Y12	I	Y signal input (CCD-FX630).	
46	Y11	I	Y signal input (CCD-FX630).	
47	Y10	I	Y signal input, LSB (CCD-FX630).	
48	VSS	–	GND	
49	IOY	O	Y signal output (current output).	Y signal D/A converter interface.
50	AVDY		+3.6V power supply.	
51	VGY		Connected to +3.6V power supply via 0.1 μF capacitor.	
52	VRFY	I	Full scale output value setting voltage.	
53	IRFY		Connected to GND via 12 kΩ resistor.	
54	AVSY		GND	
55	VBY		Connected to GND via 0.1 μF capacitor.	
56	VDD	–	+3.6V power supply	
57	BIN	I	Not used.	
58	GIN	I	Not used.	
59	RIN	I	Not used.	
60	TIKEY	I	Not used.	
61	WKEY	I	Wide ID signal input.	
62	VCK	I	PAL 4 fsc modulation clock.	
63	VHLD	I	Mosaic processing vertical hold control signal.	
64	HHLD	I	Mosaic processing horizontal hold control signal.	
65	CSYN	I	Sync signal (SYNC) input.	
66	LALT	I	PAL line modulation inverted signal input.	
67	CBK	I	Blanking signal (CBLK) input.	
68	BF	I	Burst added signal input.	
69	HD	I	Horizontal sync signal (HD) input.	
70	VD	I	Vertical sync signal (VD) input.	
71	AJST	I	Data sampling pulse input.	
72	VDD	–	+3.6V power supply.	
73	SCK	I	Serial interface clock input from camera microprocessor (IC602).	
74	SI	I	Serial interface data input from camera microprocessor.	
75	XCE	I	Serial interface enable input from camera microprocessor.	
76	SO	O	Serial interface data output to camera microprocessor.	
77	VSS	–	GND	
78	CLK	I	Clock input.	
79	DEF	I	Defect compensation position pulse.	
80	ID	I	Color line discrimination signal.	

Pin No.	Signal Name	I/O	Function
81	MCK	I	Main clock input.
82	VDD	–	+3.6V power supply.
83	XCLR	I	All clear input.
84	VDD	–	AD I/F power supply (+3.6V).
85	ADCK	O	AD converter clock output. Not used.
86	VSS	–	GND
87	AD0	I	AD data input from A/D converter (IC704), MSB.
88	AD1	I	AD data input from A/D converter.
89	AD2	I	AD data input from A/D converter.
90	AD3	I	AD data input from A/D converter.
91	AD4	I	AD data input from A/D converter.
92	AD5	I	AD data input from A/D converter.
93	AD6	I	AD data input from A/D converter.
94	AD7	I	AD data input from A/D converter.
95	AD8	I	AD data input from A/D converter.
96	AD9	I	AD data input from A/D converter, LSB.
97	VDD	–	+3.6V power supply.
98	OPD9	O	OPD (IC611) data output, MSB.
99	OPD8	O	OPD data output.
100	OPD7	O	OPD data output.

6-4. MECHANISM CONTROL MICRO PROCESSOR PIN FUNCTION (VS BOARD IC505: CXP87132-009R)

<table>
<tr><th>Pin No.</th><th>Signal Name</th><th>I/O</th><th>Function</th></tr>
<tr><td>1</td><td>RP PB MODE</td><td>O</td><td>REC/PB switching signal of REC/PB amplifier (VS board IC102) and ATF servo IC (VS board IC508).
"H": PB.</td></tr>
<tr><td>2</td><td>$\overline{\text{FE ON}}$</td><td>O</td><td>Flying erase oscillation on/off control signal. "L": Oscillation.</td></tr>
<tr><td>3</td><td>JOG VD</td><td>O</td><td>False VD signal inserted in playback video signal during variable speed playback.</td></tr>
<tr><td>4</td><td>JOG</td><td>O</td><td>Variable speed playback/normal playback switching signal of video circuit.
"H": Variable speed playback.</td></tr>
<tr><td>5</td><td>$\overline{\text{S JACK IN}}$</td><td>I</td><td></td></tr>
<tr><td>6</td><td>$\overline{\text{PB 1.7M DET}}$</td><td>I</td><td>AFM stereo tape/monaural tape discrimination input.
"H": During stereo or bilingual tape playback. (CCD-FX530)</td></tr>
<tr><td>7</td><td>JACK MON/$\overline{\text{ST}}$ DET</td><td>I</td><td>Monaural/stereo discrimination input of audio input/output terminal.
"L": When jack is inserted in right channel terminal. (CCF-FX530)</td></tr>
<tr><td>8</td><td>INT VD</td><td>O</td><td>Internal VD signal.</td></tr>
<tr><td>9</td><td>SYSTEM SYNC (PBV)</td><td>O</td><td>System synchronizing signal.</td></tr>
<tr><td>10</td><td>$\overline{\text{SYNC DET}}$</td><td>O</td><td>Sync detect output. "L" when sync is detect.</td></tr>
<tr><td>11</td><td>E/$\overline{\text{L}}$ DET</td><td>I</td><td>Normal/Hi8 discrimination input. "H" when Hi8 tape playback. Not used.</td></tr>
<tr><td>12</td><td>$\overline{\text{MIC MONO}}$</td><td>I</td><td>External microphone monaural/stereo discrimination input.
"L": When monaural microphone is used. (CCD-FX530)</td></tr>
<tr><td>13</td><td>MODE SW 0</td><td>I</td><td rowspan="3">Mode switch input.
<table>
<tr><th></th><th>BL</th><th>END</th><th>EJECT</th><th>USE</th><th>LOAD</th><th>READY</th><th>TURN</th><th>REC/PB</th><th>FF</th></tr>
<tr><td>M SW 0</td><td>H</td><td>L</td><td>L</td><td>H</td><td>L</td><td>H</td><td>H</td><td>L</td><td>L</td></tr>
<tr><td>M SW 1</td><td>H</td><td>H</td><td>L</td><td>L</td><td>L</td><td>L</td><td>H</td><td>H</td><td>L</td></tr>
<tr><td>M SW 2</td><td>H</td><td>H</td><td>H</td><td>H</td><td>H</td><td>L</td><td>L</td><td>L</td><td>L</td></tr>
</table></td></tr>
<tr><td>14</td><td>MODE SW 1</td><td>I</td></tr>
<tr><td>15</td><td>MODE SW 2</td><td>I</td></tr>
<tr><td>16</td><td>$\overline{\text{CC DOWN SW}}$</td><td>I</td><td>Cassette compartment down switch input. "L": down</td></tr>
<tr><td>17</td><td>REC PROOF SW</td><td>I</td><td>Recording-proof switch input. "H": REC prohibition.</td></tr>
<tr><td>18</td><td>ME/$\overline{\text{MP}}$ SW</td><td>I</td><td>ME/$\overline{\text{MP}}$ switch input. "L": MP, "H": ME.</td></tr>
<tr><td>19</td><td>Hi8 MP SW</td><td>I</td><td>Hi8 MP switch input. "H": Hi8 MP, "L": Normal MP or ME.</td></tr>
<tr><td>20</td><td>$\overline{\text{LM LIM ON}}$</td><td>O</td><td>Loading motor limiter on detection signal. Normally "H": "L" when limiter is on.</td></tr>
<tr><td>21</td><td>LINE MIX</td><td>O</td><td>Audio stereo/monaural control signal.</td></tr>
<tr><td>22</td><td>MX SEL 1</td><td>O</td><td rowspan="2">When recording: Monaural/stereo switching signal.
<table>
<tr><th></th><th>Monaural</th><th>Stereo</th></tr>
<tr><td>MX SEL 1</td><td>L</td><td>L</td></tr>
<tr><td>MX SEL 2</td><td>H</td><td>L</td></tr>
</table>
When playing back: Monaural/stereo/bilingual switching signal.
<table>
<tr><th></th><th>Stereo</th><th>Main</th><th>Sub</th><th>Monaural</th></tr>
<tr><td>MX SEL 1</td><td>L</td><td>L</td><td>H</td><td>L</td></tr>
<tr><td>MX SEL 2</td><td>L</td><td>H</td><td>L</td><td>H</td></tr>
</table>
(CCD-FX530)</td></tr>
<tr><td>23</td><td>MX SEL 2</td><td>O</td></tr>
<tr><td>24</td><td>MX ON/OFF</td><td>O</td><td>Matrix on/off signal. "H": Matrix on (stereo recording/playback) (CCD-FX530)</td></tr>
<tr><td>25</td><td>COMP REC</td><td>O</td><td>Video input/S video input switching signal. "H": Video input.</td></tr>
<tr><td>26</td><td>CAM/$\overline{\text{LINE}}$</td><td>O</td><td>Camera input/line input switching signal. "H": Camera input.</td></tr>
<tr><td>27</td><td>$\overline{\text{WIND}}$</td><td>O</td><td>"L": Wind sound decrease on.</td></tr>
<tr><td>28</td><td>N.C.</td><td></td><td>Not used.</td></tr>
<tr><td>29</td><td>UNLOAD</td><td>O</td><td>Loading motor control signal. When unloading: "H" or "H" pulse.</td></tr>
<tr><td>30</td><td>LOAD</td><td>O</td><td>Loading motor control signal. When loading: "H" or "H" pulse.</td></tr>
<tr><td>31</td><td>$\overline{\text{LM LIM CONT}}$</td><td>O</td><td>Loading motor limiter control signal. Momentarily "H" when loading.</td></tr>
<tr><td>32</td><td>DRUM ON</td><td>O</td><td>Drum motor on/off signal. "H" (Approx. 1.3V): Drum on.</td></tr>
<tr><td>33</td><td>DRUM RVS</td><td>O</td><td>Drum rotation direction control signal. Normally "L".</td></tr>
<tr><td>34</td><td>N.C.</td><td></td><td>Not used. (open)</td></tr>
<tr><td>35</td><td>$\overline{\text{EDIT}}$</td><td>O</td><td>Video circuit normal/EDIT switching signal. "L": When edit of menu display is at "ON".</td></tr>
<tr><td>36</td><td>E/$\overline{\text{L}}$ OUT</td><td>O</td><td>Video circuit normal/Hi8 switching signal. "H": Hi8 mode.</td></tr>
<tr><td>37</td><td>MP</td><td></td><td>Connected to GND.</td></tr>
<tr><td>38</td><td>$\overline{\text{RESET}}$</td><td>I</td><td>Reset signal from mode control micro processor (VS board IC503). When reset: "L".</td></tr>
<tr><td>39</td><td>VSS</td><td></td><td>GND</td></tr>
<tr><td>40</td><td>XTAL</td><td>O</td><td rowspan="2">11.89 MHz clock oscillation circuit.</td></tr>
<tr><td>41</td><td>EXTAL</td><td>I</td></tr>
<tr><td>42</td><td>$\overline{\text{MECHA CON CS}}$</td><td>I</td><td>Chip select signal from mode control micro processor (VS board IC503).</td></tr>
<tr><td>43</td><td>DATA TO SLAVE</td><td>I</td><td>Serial data input from mode control micro processor.</td></tr>
<tr><td>44</td><td>DATA TO MASTER</td><td>O</td><td>Serial data output to mode control micro processor.</td></tr>
<tr><td>45</td><td>$\overline{\text{MODECON SCK}}$</td><td>I</td><td>Serial clock input from mode control micro processor.</td></tr>
<tr><td>46</td><td>AUDIO MUTE</td><td>O</td><td>Audio output mute signal. "H": Mute.</td></tr>
<tr><td>47</td><td>VIDEO MUTE</td><td>O</td><td>Video output mute signal. "H": Mute.</td></tr>
<tr><td>48</td><td>MONO REC
(1.7M $\overline{\text{ON}}$/OFF)</td><td>O</td><td>Monaural/stereo recording switching signal.
"H": During monaural recording (1.7 MHz REC AFM carrier off). (CCF-FX530)</td></tr>
<tr><td>49</td><td>N.C.</td><td></td><td></td></tr>
<tr><td>50</td><td>AVSS</td><td></td><td>A/D converter system GND.</td></tr>
<tr><td>51</td><td>AVREF</td><td></td><td>A/D converter system reference voltage. Connected to SS3.6V.</td></tr>
<tr><td>52</td><td>AVDD</td><td></td><td>A/D converter system power supply. Connected to SS3.6V.</td></tr>
<tr><td>53</td><td>EXT MIC</td><td>I</td><td>External microphone discrimination input. Not used.</td></tr>
<tr><td>54</td><td>END SENS</td><td>I</td><td>Tape end detection signal. Normally: "L", "H" pulse at tape end.</td></tr>
<tr><td>55</td><td>TOP SENS</td><td>I</td><td>Tape top detection signal. Normally: "L", "H" pulse at tape top.</td></tr>
<tr><td>56</td><td>$\overline{\text{DEW DET}}$</td><td>I</td><td>Condensation detection signal. "L" when condensation present.</td></tr>
<tr><td>57</td><td>N.C.</td><td></td><td>Not used. Connected to GND.</td></tr>
<tr><td>58</td><td>ATF ERROR</td><td>I</td><td>ATF error input.</td></tr>
<tr><td>59</td><td>S REEL FG</td><td>I</td><td>S reel FG signal input.</td></tr>
<tr><td>60</td><td>T REEL FG</td><td>I</td><td>T reel FG signal input.</td></tr>
<tr><td>61</td><td>NC</td><td></td><td>Not used. Connected to GND.</td></tr>
<tr><td>62</td><td>CAM VD</td><td>I</td><td>VD signal from camera circuit sync generator (VC board IC610). V cycle pulse.</td></tr>
<tr><td>63</td><td>FLD</td><td>I</td><td>FIELD signal from camera circuit sync generator.</td></tr>
<tr><td>64</td><td>VTR SYNC</td><td>I</td><td>Composite sync signal separated from recording/playback Y signal.</td></tr>
<tr><td>65</td><td></td><td>I</td><td>Connected to GND.</td></tr>
<tr><td>66</td><td>DRUM PG</td><td>I</td><td>Drum PG signal input. For drum phase servo. 33.3 msec. cycle "H" pulse.</td></tr>
<tr><td>67</td><td>DRUM FG</td><td>I</td><td>Drum FG signal input. For drum speed servo. 2.8 msec. cycle pulse.</td></tr>
<tr><td>68</td><td>CAP FG</td><td>I</td><td>Capstan FG signal input.</td></tr>
<tr><td>69</td><td>N.C.</td><td>O</td><td>Not used.</td></tr>
</table>

6-5. MODE CONTROL MICRO PROCESSOR PIN FUNCTIONS (VS BOARD IC503: MB89098PFV-G-107-BND)

Pin No.	Signal Name	I/O	Function
1	TEST MODE 0	I	Connected to GND.
2	TEST MODE 1	I	Connected to GND.
3	X0	I	10 MHz clock oscillation circuit.
4	X1	O	
5	VSS		GND
6	$\overline{\text{RESET}}$	I	Reset input.
7	$\overline{\text{DATA SW}}$	I	Date (+) key (CK board S221) input. Normally "H". "L" when key is pressed.
8	$\overline{\text{TIME SW}}$	I	Time key (CK board S222) input. Normally "H". "L" when key is pressed.
9	$\overline{\text{EJECT SW}}$	I	Cassette eject switch (FK board S103) input. Normally "H". "L" when switch is pressed.
10	$\overline{\text{VTR MODE SW}}$	I	Power supply switch (CK board S223) input. "L" when power supply switch is at "Video".
11	$\overline{\text{AGE SW}}$	I	AGE switch (CK board S200) input. "L" when key is pressed.
12	$\overline{\text{START/STOP SW}}$	I	Start/stop key (FK board S102) input. "L" when key is pressed.
13	$\overline{\text{CC DOWN SW}}$	I	CCDOWN switch (mechanism section) input. "L" when cassette compartment is locked.
14	$\overline{\text{CAM+STBY SW}}$	I	Power supply switch (CK board S223), stand-by switch (FK board S101) input. "L" when power supply switch is at "Camera" and stand-by switch at "Standby".
15	BATT IN	I	Main battery detection input. "H" when main battery is loaded or external power supply is connected.
16	PB V	I	System sync signal from mechanism control micro processor (VS board IC505).
17	RF SWP	I	RF switching pulse.
18	$\overline{\text{LANC POWER ON}}$	I	Power on signal input from wired remote commander. "L" when power switch of remote commander is pressed.
19	$\overline{\text{LI PRE END}}$	I	Lithium battery end detection input. "L" when lithium battery has worn out or has not been loaded.
20	$\overline{\text{EEPROM WE}}$	O	EEPROM (VS board IC502) writing enable signal. "L" when writing data.
21			Not used.
22			
23	$\overline{\text{TALLY LED}}$	O	Tally LED on/off signal.
24	$\overline{\text{SYSTEM RESET}}$	O	Reset signal of all systems. Normally "H". "L" when reset.
25	N.C.	O	Not used.
26	BATT IN	I	
27	N.C.		Not used.
28	N.C.		
29	N.C.		
30	$\overline{\text{SIRCS SIG}}$	I	Infrared remote commander signal input.
31	N.C.		Not used.
32			
33	$\overline{\text{CS EEPROM}}$	O	Chip select signal to EEPROM (VS board IC502).
34	$\overline{\text{CS VIDEO}}$	O	Chip select signal to video IC (VS board IC201).
35	EVF DA STB	O	Not used.
36	$\overline{\text{CS SG}}$	O	Chip select signal to SYNC generator (VC board IC610).
37	CS DA	O	Strobe signal to DA (VS board IC951).
38	$\overline{\text{CS CAM}}$	O	Chip select signal to camera micro processor (VC board IC602).
39	N.C.	O	Not used.
40	N.C.	O	

Pin No.	Signal Name	I/O	Function
70	T/E LED ON	O	TAPE LED on/off signal. 200 msec. cycle "H" pulse during REC/PB.
71	SP/$\overline{\text{LP}}$	O	SP/LP switching signal. "L": LP.
72	ME/$\overline{\text{MP}}$ OUT	O	Recording current switching signal. "H": ME tape.
73	CAP PWM	O	Capstan error signal output. PWM signal.
74	DRUM PWM	O	Drum error signal output. PWM signal.
75	CFG HMS	I	Capstan FG signal input.
76	5.9M ATF CLK	O	Clock signal for ATF servo IC (IC508).
77	$\overline{\text{CS TO ATF}}$	O	Chip select signal for ATF servo IC.
78	DATA TO ATF	O	Serial data output to ATF servo IC.
79	$\overline{\text{ATF SCK}}$	O	Serial clock output to ATF servo IC.
80	ATF STBY	O	Standby signal for ATF servo IC.
81	SP/LP DET	I	Discriminates recording mode.
82	CLOG DET	I	Head clog detection signal. "L": Normal.
83	REF PILOT	O	Reference pilot signal for ATF servo.
84	N.C.		Not used. Connected to GND.
85	N.C.	I	
86	VSS		GND
87	VDD		Connected to SS5V.
88	VPP		
89	DRUM ACC	O	Drum motor acceleration signal.
90	DRUM BLK	O	Drum motor brake signal. Normally: "L".
91	N.C.		Not used. (open)
92	N.C.	O	
93	VIDEO IN/$\overline{\text{OUT}}$	O	Video input/output switching signal. "H": Video output.
94	AUDIO $\overline{\text{IN}}$/OUT	O	Audio input/output switching signal. "H": Audio output.
95	VA PB MODE	O	REC/PB switching signal of video; audio circuit. "H": PB.
96	VI SWP	O	RF switching pulse signal for video circuit.
97	RF SWP	O	RF switching pulse signal for REC/PB amp and audio circuit.
98	HEAD CHG	O	Head switching signal.
99	CAP ON	O	Capstan driver on/off control signal. "H": Capstan on.
100	CAP FWD/$\overline{\text{RVS}}$	O	Capstan rotation direction control signal. "H": FWD. "L": RVS.

Pin No.	Signal Name	I/O	Function
41	N.C.		Not used.
42	N.C.		
43	SEG19	O	LCD segment terminal drive signal. Pulse of 4 values (0V, 1.2V, 2.4V and 3.6V). Not used.
44	SEG18	O	
45	SEG17	O	
46	SEG16	O	
47	VCC		+3.6V power supply (+3V power supply during backup).
48	SEG15	O	LCD segment terminal drive signal. Pulse of 4 values (0V, 1.2V, 2.4V and 3.6V). Not used.
49	SEG14	O	
50	SEG13	O	
51	SEG12	O	
52	SEG11	O	
53	SEG10	O	
54	SEG09	O	
55	SEG08	O	
56			GND
57	SEG07	O	LCD segment terminal drive signal. Pulse of 4 values (0V, 1.2V, 2.4V and 3.6V). Not used.
58	SEG06	O	
59	SEG05	O	
60	SEG04	O	
61	SEG03	O	
62	SEG02	O	
63	SEG01	O	
64	SEG00	O	
65	V3	I	3.6V LCD drive bias voltage. Not used.
66	V2	I	2.4V
67	V1	I	1.2V
68	V0	I	0V
69	COM0	O	LCD COM terminal drive signal. Pulse of 4 values (0V, 1.2V, 2.4V and 3.6V). Not used.
70	COM1	O	
71	COM2	O	
72	COM3	O	
73	$\overline{\text{CS OSD}}$	O	Chip select signal to character generator (VC board IC614).
74	$\overline{\text{CS MECHA}}$	O	Chip select signal to mechanism control micro processor (VS board IC505).
75	DATA TO MASTER	I	Serial data input signal.
76	DATA TO SLAVE	O	Serial data output signal.
77	$\overline{\text{MODECON SCK}}$	O	Serial data transfer clock.
78	N.C.	O	Not used.
79	VTR DD ON	O	VTR DC-DC converter control signal. "H" when power switch is at "Player" or "Camera".
80	CAM DD ON	O	CAMERA DC-DC converter control signal.
81	AVSS		A/D port GND.
82	K AD IN 0	I	Key input. A/D port. FF key (FK board S105) STOP key (FK board S104)
83	K AD IN 1	I	Key input. A/D port. PLAY key (FK board S111) REW key (FK board S110) PAUSE key (FK board S109)
84	K AD IN 2	I	Key input. A/D port. SET key (CK board S204) SELECT (–) key (CK board S203) SELECT (+) key (CK board S202) MENU key (CK board S201)
85	K AD IN 3	I	Key input. A/D port. FOCUS MANUAL key (CK board S211) FADER key (CK board S208) BACK LIGHT key (CK board S207) PROGRAM AE key (CK board S205)
86	K AD IN 4	I	Key input. A/D port. STEADY SHOT key (CK board S211) EDIT SEARCH (–) key (CK board) EDIT SEARCH (+) key (CK board) COUNTER RESET key (CK board)
87	N.C.		Not used.
88	N.C.		
89	N.C.		
90	AVCC		A/D port power supply (+3.6V).
91	BATT SENS	I	For main battery voltage input. (Voltage divided into 1/3.14 by R586, R587).
92	N.C.	I	Not used.
93	BRIGHA B	I	Brightness adjusting dial input. Pulse input by dial rotation. Not used.
94	BRIGHT B	I	Brightness adjusting dial input. Pulse input by dial rotation. Not used.
95	LANC IN	I	LANC serial data input.
96	LANC OUT	O	LANC serial data output.
97	BUZZER	O	Buzzer output.
98	VCC		+3.6V power supply.
99	CL1	O	32 kHz clock oscillation circuit (for clock).
100	CL0	I	

SECTION 7
ADJUSTMENTS

7-1. CAMERA SECTION ADJUSTMENTS

When performing adjustments, refer to the layout diagrams for adjustment related parts beginning from page 7–24.

1-1. PREPARATIONS BEFORE ADJUSTMENT (CAMERA SECTION)

1-1-1. List of Service Tools

- Oscilloscope
- Adjusting driver
- Regulated power supply
- Color monitor
- Vectorscope
- Digital voltmeter

Ref. No.	Name	Parts Code	Usage
J-1	Filter for color temperature correction (C14)	J-6080-058-A	Auto white balance adjustment/check White balance adjustment/check
J-2	ND filter 1.0	J-6080-808-A	White balance check
	ND filter 0.3	J-6080-818-A	White balance check
J-3	Pattern box PTB-450	J-6082-200-A	
J-4	Color chart for pattern box	J-6020-250-A	
J-5	Adjusting remote commander (RM-95-remodeled partly)[Note 1]	J-6082-053-A	
J-6	Siemens star	J-6080-875-A	For checking the flange back
J-7	Extension cable (42P, 0.8 mm)	J-6082-285-A	For extension between the VC board (CN601) and VS board (CN203)
	Extension cable (34P, 0.8 mm)	J-6082-286-A	For extension between the AU-168 board CN1302 and VS-111 board (CN202), For CCD-FX530
J-8	Extension cable (9P, 0.8 mm)	J-6082-288-A	For extension between the FK board and VS board (CN502)
	Extension cable (18P, 0.8 mm)	J-6080-289-A	For extension between the CK board and VS board (CN503)

Note 1: If the micro processor IC in the adjusting remote commander is not the new micro processor (UPD7503G-C56-12), the pages cannot be switched. In this case, replace with the new micro processor (8-759-148-35).

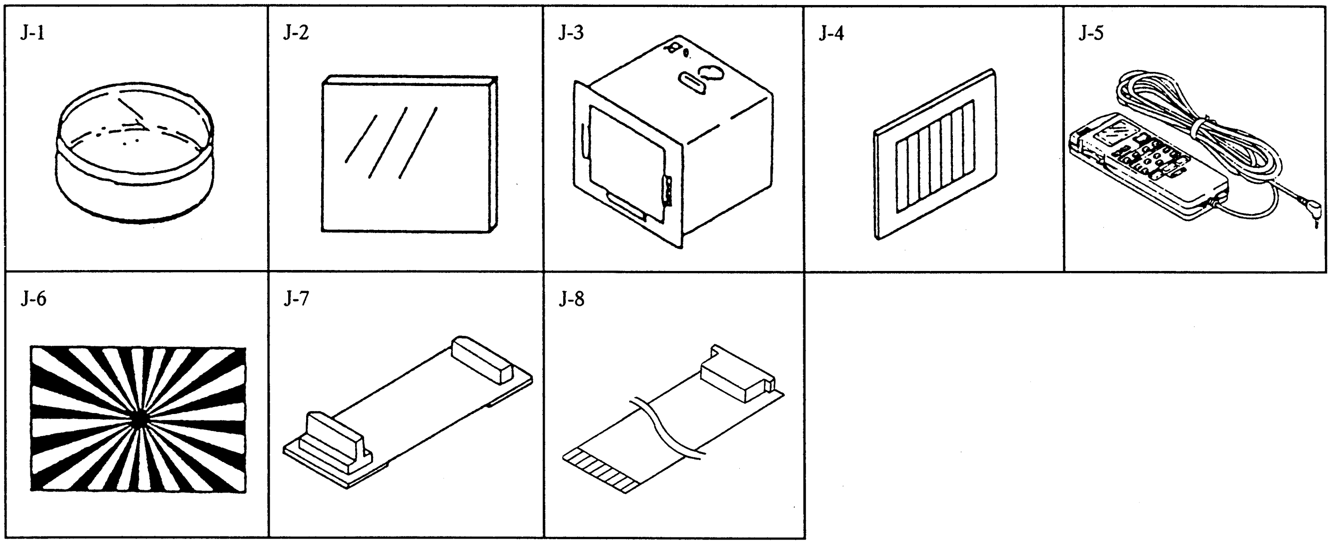


Fig. 7-1-1.

1-1-2. Preparations

Note 1: For further details of how to remove the cabinet and each board, refer to "2. Disassembly".

Note 2: When adjusting only, the lens block and VC board need not be taken apart.

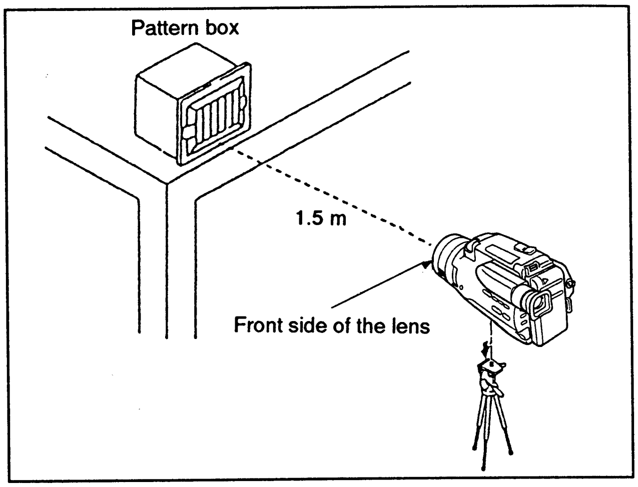


Fig. 7-1-2.

1) Connect the equipments for adjusting as shown in Fig. 7-1-3.
2) The F panel block (MA board) is not required in adjustments. Remove the following connector.
   1. CN402 of the AU-157 board (CCD-FX430/FX435/FX630)
      CN1301 of the AU-168 board (CCF-FX530)
3) If remove the cabinet (R) (Power switch, camera function switch and electronic view-finder), set to the camera power supply ON mode (Note 1), and disconnect the following connectors.
   1. CN503 of VS board
   2. CN206 of VS board
   3. CN101 of ZB board

   Be sure to exit this mode after completing the adjustment. (Note 2)
4) Turning OFF the Auto Focus Using the Adjusting Remote Commander
   1. Set data: 01 to page: 6, address: 25.
      (The auto focus will turn OFF. The focus can be adjusted using the focus button on the adjusting remote commander. But the HOLD switch must be set to OFF.)
   2. After completing the adjustment/operation check, set data: 00 to page: 6, address: 25.
5) Turning OFF the STEADY SHOT Function Using the Adjusting Remote Commander (CCD-FX630)
   1. Set data: 02 to page: 6, address: 32.
   2. Set data: 01 to page: 6, address: 33.
      (The STEADY SHOT will go OFF.)
   3. After completing the adjustment/operation check, return the data of address: 32 and address: 33 of page: 6 to 00.

Note 1: Setting the Forced Camera Power Supply ON Mode
1) Set data: 01 to page: 1, address: 00.
2) Set data: 21 to page: D, address: 03, and press the PAUSE button of the adjusting remote commander.

By carrying out the above, the camera can be operated even if the cabinet (R) has been removed. Be sure to exit the forced camera power ON mode after completing the adjustment.

Note 2: Exiting the Forced Camera Power Supply ON Mode
1) Set data: 01 to page: 1, address: 00.
2) Set data: 00 to page: D, address: 03, and press the PAUSE button of the adjusting remote commander.
3) Set data: 00 to page: 1, address: 00.

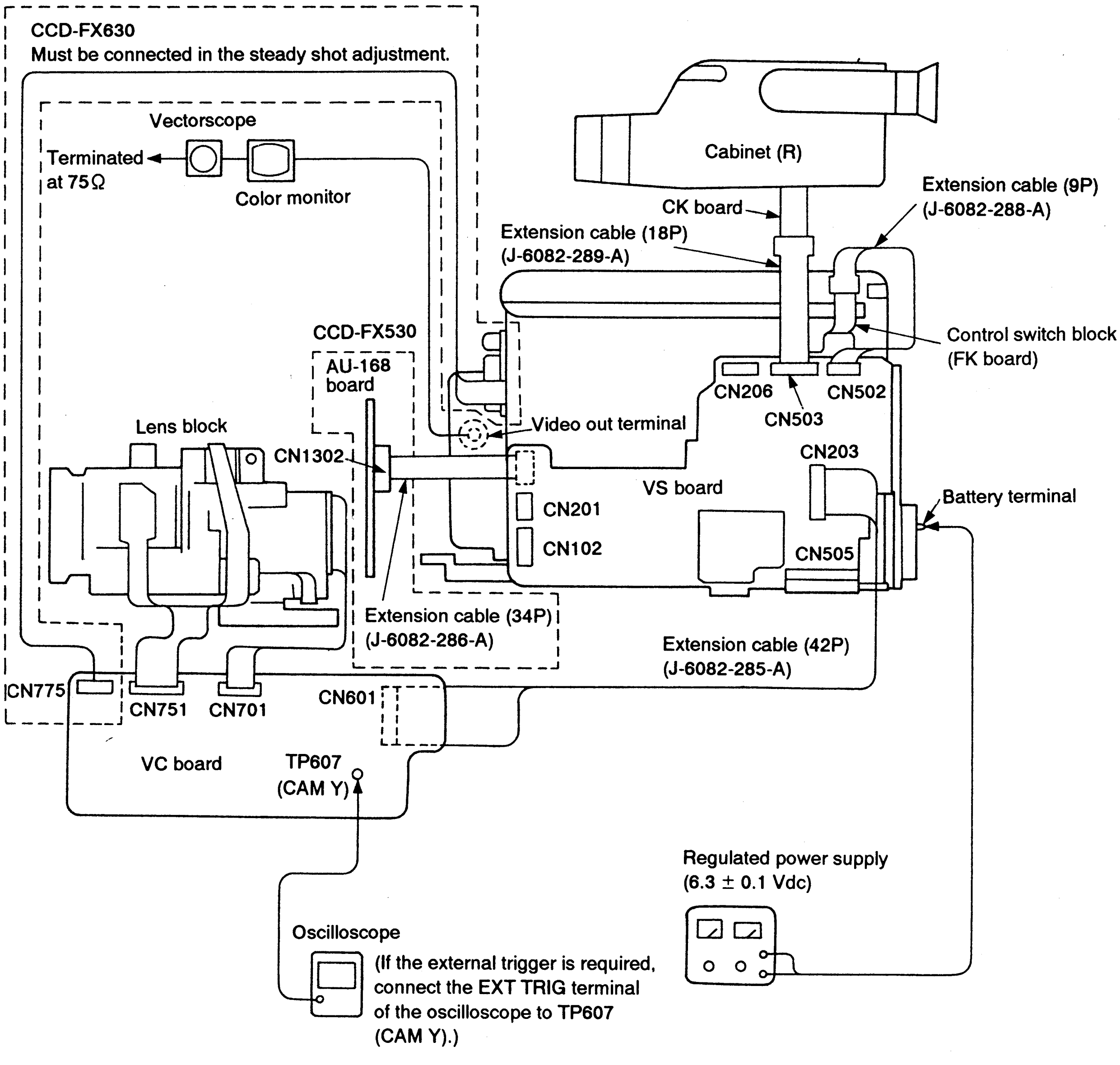

CCD-FX630
Must be connected in the steady shot adjustment.
Vectorscope
Terminated at 75Ω
Color monitor
Cabinet (R)
CK board
Extension cable (9P)
(J-6082-288-A)
Extension cable (18P)
(J-6082-289-A)
Control switch block
(FK board)
CCD-FX530
AU-168 board
CN206
CN502
CN503
Lens block
Video out terminal
CN1302
CN203
VS board
Battery terminal
CN201
CN102
CN505
Extension cable (34P)
(J-6082-286-A)
Extension cable (42P)
(J-6082-285-A)
CN775
CN751
CN701
CN601
VC board
TP607
(CAM Y)
Regulated power supply
(6.3 ± 0.1 Vdc)
Oscilloscope
(If the external trigger is required, connect the EXT TRIG terminal of the oscilloscope to TP607 (CAM Y).)

Fig. 7-1-3.

1-1-3. Precautions

1. Switch settings

Adjust the switches to the following positions, and adjust without loading the cassette tape, unless specified otherwise.

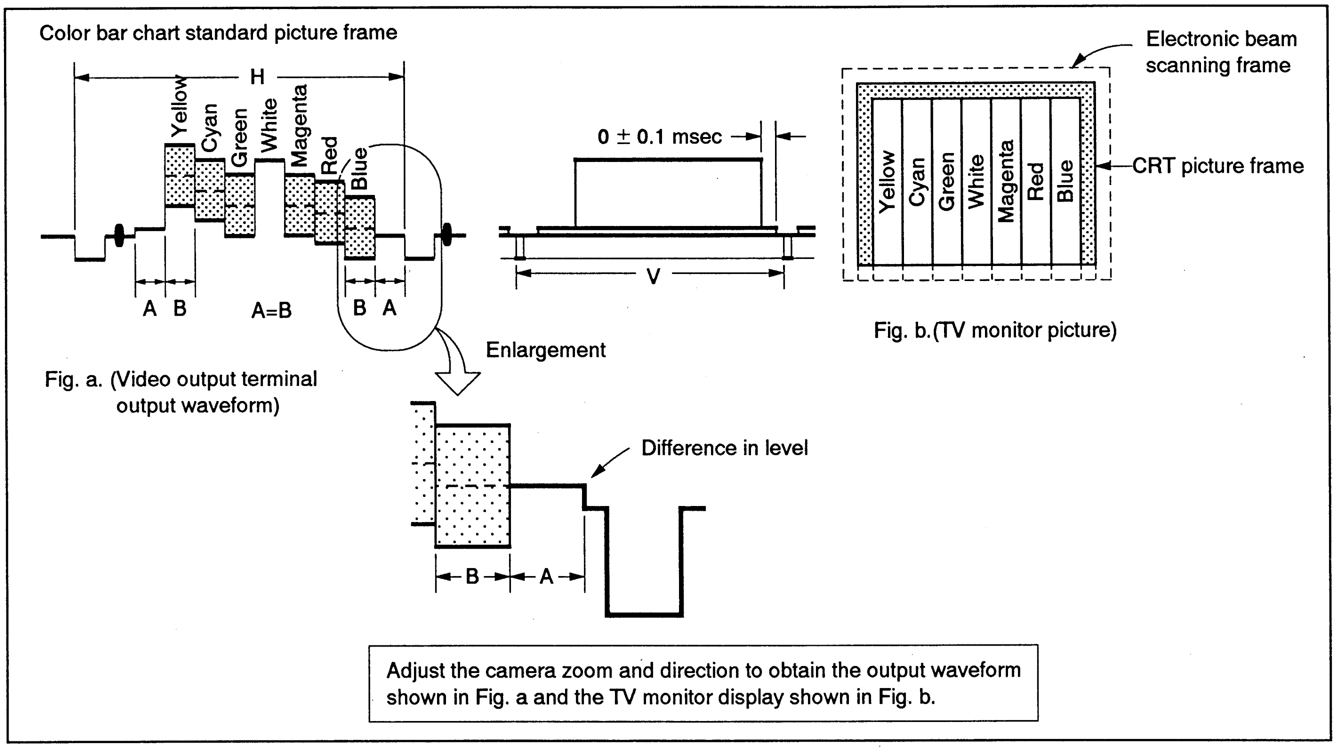
1. Camera/player power switch (Control switch block (CK board)) ······················Camera
2. Standby switch (Control switch block (FK board)) ·· Standby
3. PROGRAM AE button (Control switch block (CK board)) ···Off
4. FOCUS switch (F lens block) ····························Manual
5. BACK LIGHT button (Control switch block (CK board)) ···Off
6. STEADY SHOT button (CCD-FX630 Control switch block (CK board)) ··········Off

2. Adjusting Procedure

Adjust in the given order.

3. Subject

1) Color bar chart (Standard picture frame)
   Adjust the picture frame as shown in Fig. 7-1-4. if adjustments are performed using the color bar chart. (Standard picture frame)
2) White pattern (Standard picture frame)
   Remove the color bar chart from the pattern box, and so that the white pattern will be displayed. (Don't touch the zoom switch)


Color bar chart standard picture frame
H
Yellow
Cyan
Green
White
Magenta
Red
Blue
A B
A=B
B A
Fig. a. (Video output terminal output waveform)
Enlargement
0 ± 0.1 msec
V
Difference in level
B
A
Electronic beam scanning frame
CRT picture frame
Yellow
Cyan
Green
White
Magenta
Red
Blue
Fig. b.(TV monitor picture)

Adjust the camera zoom and direction to obtain the output waveform shown in Fig. a and the TV monitor display shown in Fig. b.

Fig. 7-1-4.

3) Chart for flange back adjustment
   Combine a white A0 size (1189 mm× 841 mm) paper to a black one, and make the chart shown in Fig. 7-1-5.

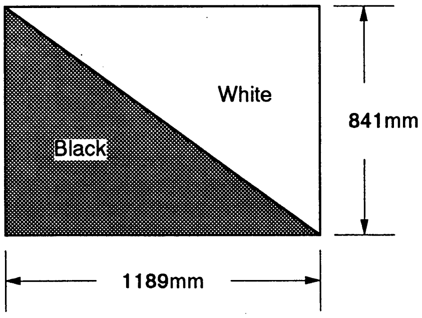

White
Black
841mm
1189mm

Fig. 7-1-5.

Note: Use the non-reflecting and non-glazing vellum paper whose size is more than A0, and make the boundary between white and black to be smoothly flat.

1-1-4. Adjusting Remote Commander

The camera section is adjusted by changing the constant or coefficient of the digital signal processing calculation, or modifying the output voltage of the EVR IC (VC board IC603). This is controlled by the camera micro processor (VC board IC602), which reads the data written in the nonvolatile memory (VC board IC601: EEPROM), and transmits it to the digital signal processing circuit and EVR.

To perform adjustments, adjustment data written in the nonvolatile memory must be rewritten, using the adjusting remote commander.

The adjusting remote commander uses the remote commander signal line (LANC) to communicate mutually with the camera microprocessor. The page, address and the up/down commands of the data are transmitted from the adjusting remote commander to the camera micro processor. And, the page, address, and data are transmitted for the vice versa.

1. Using the adjusting remote commander

1) Connect the adjusting remote commander to the remote terminal.
2) Adjust the HOLD switch of the adjusting remote commander to "HOLD" (SERVICE position).

If it has been properly connected, the LCD on the adjusting remote commander will display as shown in Fig. 7-1-6.

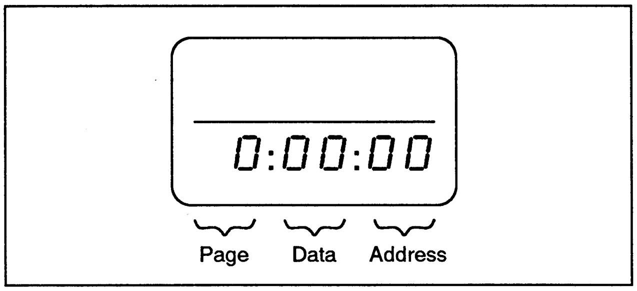


Fig. 7-1-6.

3) Operate the adjusting remote commander as follows.
   - Changing the page

     The page increases when the EDIT SEARCH+ button is pressed, and decreases when the EDIT SEARCH– button is pressed. There are altogether 16 pages, from 0 to F.

Hexadecimal notation	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
LCD Display	0	1	2	3	4	5	6	7	8	9	A	b	c	d	E	F
Decimal notation conversion value	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Table 7-1-1.

   - Changing the address

     The address increases when the FF (▶▶) button is pressed, and decreases when the REW (◀◀) button is pressed. There are altogether 256 addresses, from 00 to FF.
   - Changing the data (Data setting)

     The data increases when the PLAY (▶) button is pressed, and decreases when the STOP (■) button is pressed.

     There are altogether 256 data, from 00 to FF.
   - Writing the adjustment data

     The PAUSE button must be pressed to write the adjustment data (F page) in the nonvolatile memory.

     (The new adjustment data will not be recorded in the nonvolatile memory if this step is not performed.)
4) Select page: 6, address: 00, and adjust the data to 01. Page F, and enables the camera section (Addresses 01 to BF of page F) to be adjusted.
5) After completing all adjustments, turn off the main power supply (6.3V) once.

2. Precautions upon using the adjusting remote commander

Mishandling of the adjusting remote commander may erase the correct adjustment data at times. To prevent this, it is recommended that all adjustment data be noted down before beginning adjustments and new adjustment data after each adjustment.

1-1-5. Page F Address List

Note 1: The data already listed in the adjustment data memo column are fixed values.

Note 2: The adjustment data initial values are values just after executing “Page F Data Initialization” and “Page F Data Modification”. They are different from the values after executing all adjustments.

Note 3: In some cases, data have been input to the page F addresses C0 to FF. This has no relation to the adjustments.

Note 4: No mark : CCD-FX430/FX435/FX530
( ) : CCD-FX630

Address	Adjustment data	
	Initial value	Memo column
00	62 (60)	62 (60)
01	02 (00)	02 (00)
02	00	00
03	00 (07)	00 (07)
04	80	
05	80	
06	80	
07	80	
08	2D	
09	26	
0A	FA	
0B	F1	
0C	30	
0D	00	
0E	58	
0F	00	
10	E0	E0
11	8F	
12	6C	
13	36	
14	3C	
15	B6	
16	0D	
17	A3	
18	12	
19	8E	
1A	10	
1B	E2	
1C	0E	0E
1D	00	00
1E	80	
1F	80	
20	80 (79)	80 (79)
21	80 (79)	80 (79)
22	00	00
23	59	53
24	43	43
25	A5 (B5)	A5 (B5)
26	23	23
27	3A	3A
28	A2	A2
29	0B	0B
2A	0C (2C)	0C (2C)
2B	58	58
2C	FF	FF
2D	06	06
2E	17 (16)	17 (16)
2F	22 (27)	22 (27)
30	08	08
31	00	00
32	50 (47)	50 (47)
33	68	68
34	00 (02)	00 (02)
35	50	50
36	02	02
37	00	00
38	76	76
39	6A	6A
3A	80	80
3B	20	20
3C	F0	F0
3D	03 (02)	03 (02)
3E	00	
3F	00	
40	00	
41	00	
42	00	
43	00	
44	00	
45	00	
46	00	
47	00	
48	00	
49	00	
4A	00	
4B	00	
4C	00	
4D	00	

Table 7-1-2 (1).

Table 7-1-2 (2).

Address	Adjustment data	
	Initial value	Memo column
4E	00	00
4F	20	20
50	02 (32)	02 (32)
51	02	02
52	66	66
53	18	18
54	66 (6B)	66 (6B)
55	9F	9F
56	66	66
57	66 (6C)	66 (6C)
58	59 (5C)	59 (5C)
59	83	83
5A	67	67
5B	5C	5C
5C	5C	5C
5D	4A	4A
5E	1E (20)	1E (20)
5F	5C	5C
60	3A (3C)	3A (3C)
61	33	33
62	0C	0C
63	26	26
64	04	04
65	02	02
66	00	00
67	00	00
68	00	00
69	00	00
6A	00	00
6B	00	00
6C	00	00
6D	00	00
6E	00	00
6F	34	34
70	10	10
71	26	26
72	0F	0F
73	0F	0F
74	00	00
75	23	23
76	1B	1B
77	E0	E0
78	A0	A0
79	30	30

Table 7-1-2 (3).

Address	Adjustment data	
	Initial value	Memo column
7A	10	10
7B	50	50
7C	58	58
7D	88	88
7E	66	66
7F	46	46
80	8F	8F
81	13	13
82	30	30
83	60	60
84	70	70
85	80	80
86	A0	A0
87	C0	C0
88	70	70
89	78	78
8A	80	80
8B	90	90
8C	A0	A0
8D	40	40
8E	FF	FF
8F	00	00
90	00	00
91	77	77
92	00	00
93	FB	FB
94	02	02
95	32	32
96	6B	6B
97	8D	8D
98	A1	A1
99	30	30
9A	30	30
9B	21	21
9C	91	91
9D	72	72
9E	00	00
9F	00	00
A0	00	00
A1	00	00
A2	00	00
A3	00	00
A4	02	02
A5	80	80

Table 7-1-2 (4).

Address	Adjustment data	
	Initial value	Memo column
A6	00	00
A7	80	80
A8	00	00
A9	80	80
AA	00	00
AB	80	80
AC	00	00
AD	00	00
AE	02	02
AF	44	44
B0	3D	3D
B1	1B (25)	1B (25)
B2	3D	3D
B3	1B (25)	1B (25)
B4	A4 (A2)	A4 (A2)
B5	4B	4B
B6	00	00
B7	20	20
B8	00	00
B9	05	05
BA	00	00
BB	20	20
BC	00	00
BD	70 (6E)	70 (6E)
BE	35 (32)	35 (32)
BF	54	54
C0 to EF		
F0		
F1		
F2		
F3		
F4		
F5		
F6		
F7		
F8		
F9		
FA		
FB		
FC		
FD		
FE		
FF		

Table 7-1-2 (5).

1-1-6. Data Processing

The calculation of the DDS display and the adjusting remote commander display data (hexadecimal notation) are required for obtaining the adjustment data of some adjustment items. In this case, after converting the hexadecimal notation to decimal notation, calculate and convert the result to hexadecimal notation, and use it as the adjustment data. Table 7-1-3. indicates the hexadecimal notation-the decimal notation calculation table.

Hexadecimal notation-Decimal notation

The lower digits of the hexadecimal notation The upper digits of the hexadecimal notation	0	1	2	3	4	5	6	7	8	9	A (A)	B (b)	C (c)	② D (d)	E (E)	F (F)
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
5	80	80	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A (A)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
① B (b)	176	177	178	179	180	180	182	183	184	185	186	187	188	189	190	191
C (c)	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D (d)	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E (E)	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F (F)	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Note: ( ) indicate the adjusting remote control unit display.

(Example) In the case that the DDS display and the adjusting remote control unit display are BD (b d).
As the upper digit of the hexadecimal notation is B (b), and the lower digit is D (d), the intersection "189" of the ① and ② in the above table is the decimal notation to be calculated.

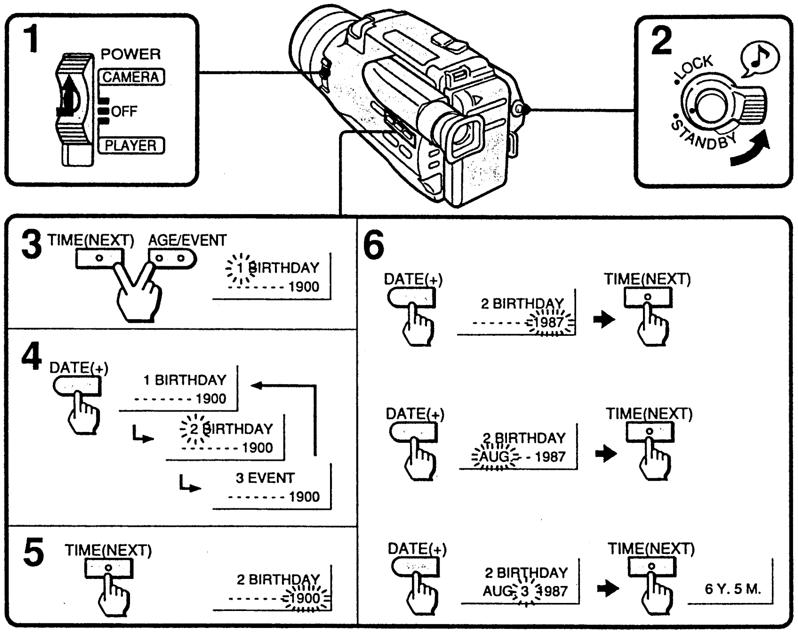
Table 7-1-3.

Recording with the Age

Storing a Birth Date in Your Camcorder

By presetting your child's birth date in your camcorder, you can record your child's age in years and months on your tape. Once you enter the birth date of your child, the camcorder's clock will automatically update the age of your child. You can preset up to three birth dates or events in the camcorder's memory.

Before storing a birth date, make sure a power source and the lithium battery are installed, and the date setting is correct. The following procedure stores "Aug. 3 1987" in memory 2 as an example.
(1) While pressing the small green button on the POWER switch, slide to CAMERA. **(2)** Turn STANDBY up. **(3)** Press TIME (NEXT) and AGE/EVENT simultaneously for a few seconds until the "1 BIRTHDAY--- --1900" indicator appears in the viewfinder. **(4)** Press DATE (+) to select "2 BIRTHDAY". **(5)** Press TIME (NEXT). The "1900" indicator flashes. **(6)** Enter the birth date by adjusting the flashing indicators of the year, month and day by pressing DATE (+) and TIME (NEXT). Note that when you keep DATE (+) pressed, the digits advance faster.



Note on the birth or event dates indicators
Each time you press DATE (+), the display in the viewfinder changes from "1 BIRTHDAY" to "2 BIRTHDAY", "3 EVENT" and comes back to "1 BIRTHDAY".

Erasing the Age Indicator in the Viewfinder

Press AGE/EVENT repeatedly until no indicator appears.

If You Missed the Correct Number with DATE (+)

Keep pressing DATE (+). The indicator changes as follows:

Year: "1900" → "1901" ---→ Current year
└-- Current year minus 99 ←┘

Month: "JAN." → "FEB." ---→ "DEC." → "---"

Day: "1" → "2" ---→ "31"

To Correct the Setting

Repeat steps from 3 to 6.

To Preset the Year before 1900

(1) After step 5, keep pressing DATE (+) until the current year is displayed. **(2)** Press DATE (+) again. The year goes back 99 years. **(3)** Go to step 6.

When in 2000

"--- -- 1901" is displayed in step 3. After that, it advances every year as "1902, 1903 .....".

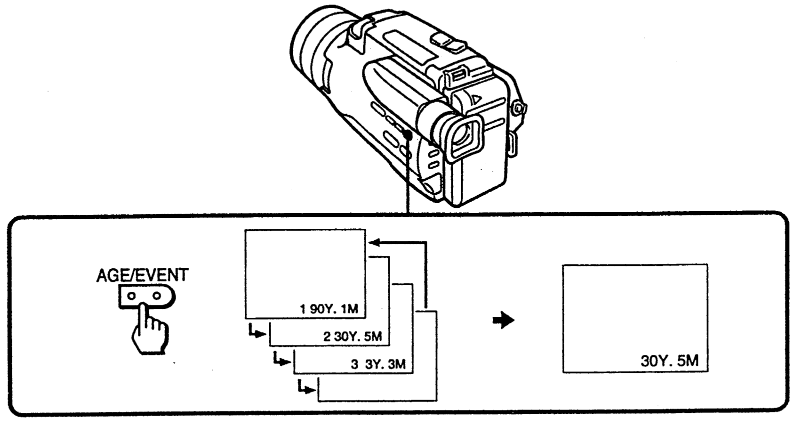
To Cancel the Stored Birth Date

(1) Press AGE/EVENT and TIME (NEXT) simultaneously to make 1 BIRTHDAY appear in the viewfinder. Press DATE (+) to select a birth date to cancel. **(2)** Press TIME (NEXT) twice. The month indicator flashes. **(3)** Press DATE (+) repeatedly until "--- --" appears. **(4)** Press TIME (NEXT). The selected birth date is canceled from the memory and is not displayed when you press AGE/EVENT.

Recording with the Age

Recording with the Age

Make sure the age is set. While recording, press AGE/EVENT to select memory 1, 2 or 3. You can record the time elapsed since the date set, for example, your child's birthday. Except for the age, date or time (p. 21) indicator, no indicator in the viewfinder is recorded.



Note on the age indicator

Each time you press AGE/EVENT, the indicator changes from 1 "The first age" to 2 "The second age", 3 "The third age" and back to no indicator. Items for which no setting has been made will be skipped. The 1, 2 or 3 indicator disappears after one second.

To Stop Recording with the Age

Press AGE/EVENT repeatedly until the age indicator disappears.

To Correct the Age Settings while Recording

Press AGE/EVENT repeatedly until the desired age appears. The recording starts after the 1, 2 or 3 indicator disappears.

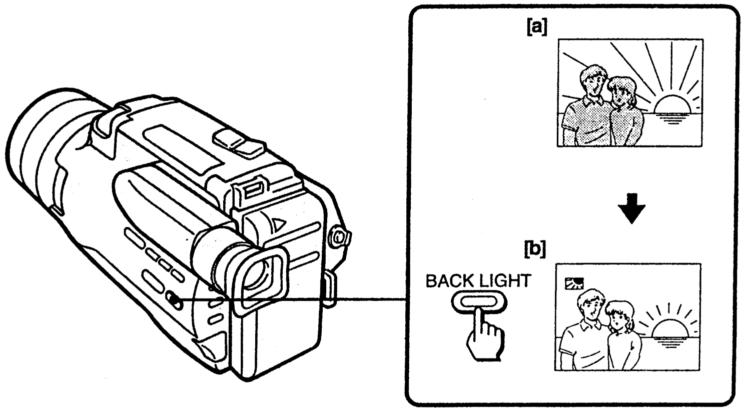
When the camcorder is connected to a TV

The age indicator appears on the TV screen after the 1, 2 or 3 indicator disappears in the viewfinder screen.

Shooting with Backlighting

When you shoot a subject with the light source behind the subject or a subject with a light background, use the BACK LIGHT function.

Press BACK LIGHT. The ▨ indicator appears in the viewfinder.



[a] Subject is too dark because of backlight.
[b] Subject becomes bright with backlight compensation.

After shooting

Be sure to release this adjustment condition by pressing BACK LIGHT again. The ▨ indicator in the viewfinder disappears. Otherwise, the picture will be too bright under normal lighting condition.

This function is also effective under the following conditions:

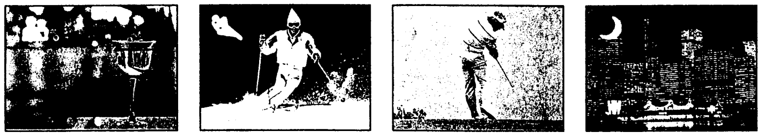
- Under normal lighting condition
- On snow, e.g. at a ski resort
- At the beach under strong sunshine
- A subject with a light source nearby or a mirror reflecting light
- A white subject against a white background. Especially when you shoot a person wearing shiny clothes made of silk or synthetic fiber, his or her face tends to become dark if you do not use this function.

Using the PROGRAM AE Function

You can select from four PROGRAM AE (Auto Exposure) modes to suit your shooting situation. When you use PROGRAM AE, you can get a Portrait effect (the subject is in focus and the background is out of focus), capture high-speed action, or record night views.

Selecting the Best Mode

Select one of four modes, referring to the following.



Portrait mode
- A still subject such as a person or a flower
- Zooming in on a subject in the telephoto mode
- A subject behind an obstacle such as a net

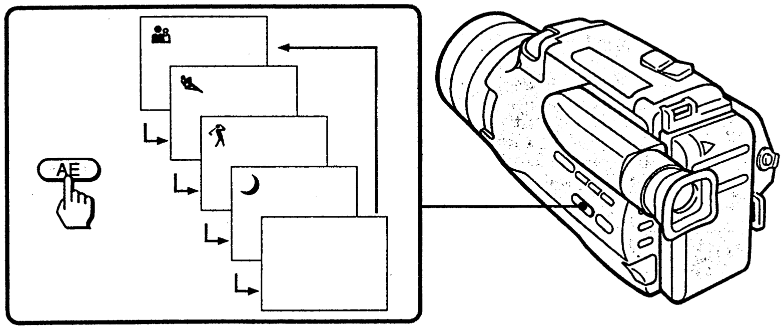
Sports mode
- Outdoor sports scenes such as football, tennis, golf or skiing
- A landscape from a moving car

High-speed shutter mode
- A golf swing or a tennis match in fine weather with the ball captured clearly
- Playing back certain scenes with high-speed movements in a clear, sharp picture

Twilight mode
- Recording night views, neon signs or fireworks

Using the PROGRAM AE Function

Press PROGRAM AE. The indicator of the selected PROGRAM AE mode appears in the viewfinder.



Note on shutter speed

The shutter speed in each PROGRAM AE mode is as follows:

Portrait mode — between 1/60 to 1/2000
Sports mode — between 1/60 to 1/500
High-speed shutter mode — 1/4000
Twilight mode — 1/60
Normal mode — 1/60

Fade-in and Fade-out

— For the models with FADER button (CCD-FX435/FX530/FX630)

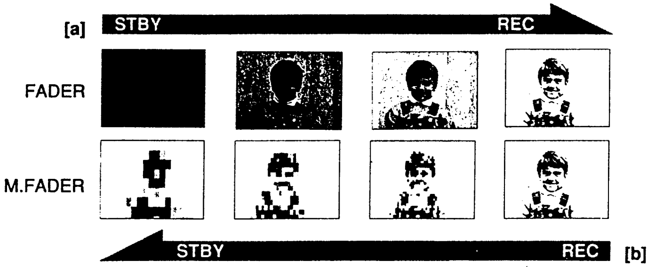
You can fade in or out to give your recording a professional appearance.
When fading in, the picture gradually fades in from black or mosaic while the sound increases. When fading out, the picture gradually fades to black or mosaic while the sound decreases.

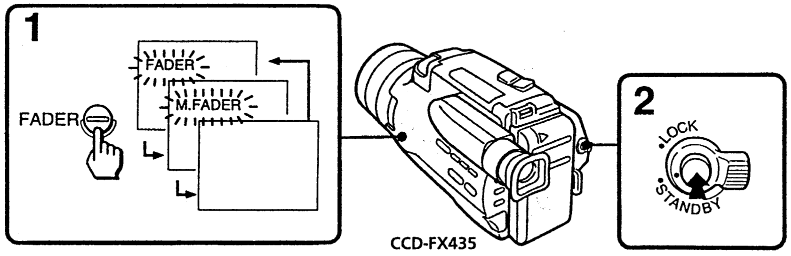
When Fading in [a]

(1) While the camcorder is in Standby mode, press FADER. The fade indicator starts flashing. **(2)** Press START/STOP to start recording. The fade indicator stops flashing.

When Fading out [b]

(1) During recording, press FADER. The fade indicator starts flashing. **(2)** Press START/STOP to stop recording. The fade indicator stops flashing, and then recording stops.





To Cancel the Fade-in/Fade-out Function

Before pressing START/STOP, press FADER until the fade indicator disappears.

When the date/time or age indicator is displayed

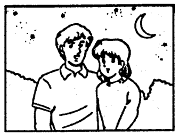
The date/time or age indicator does not fade in nor fade out.

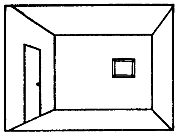
Focusing Manually

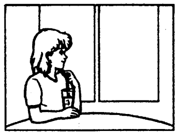
— For models with the FOCUS switch (CCD-FX630 only)

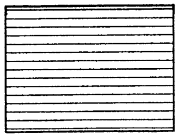
When to Use Manual Focus

In the following cases you should obtain better results by adjusting the focus manually.


[a]


[b]

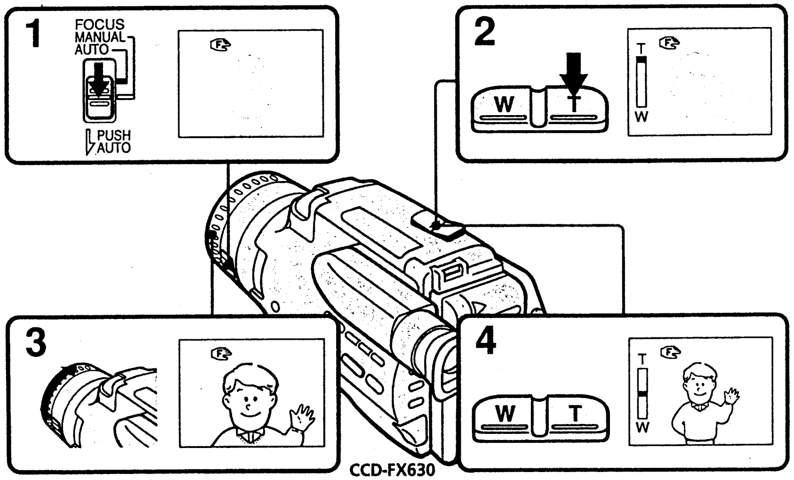

[c]


[d]

- Insufficient light **[a]**
- Subjects with little contrast — walls, sky, etc. **[b]**
- Too much brightness behind the subject **[c]**
- Horizontal stripes **[d]**
- Subject through frosted glass
- Subjects beyond nets, etc.
- Bright subject or subject reflecting light
- Shooting a stationary subject when using a tripod

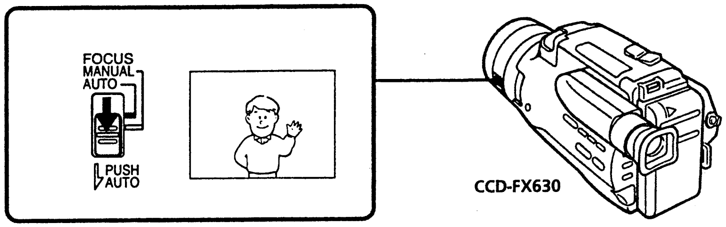
Focusing Manually

When focusing manually, first focus in telephoto before recording, and then reset the shot length.
(1) Set FOCUS to MANUAL. The Ⓕ indicator appears in the viewfinder. **(2)** Keep pressing the "T" (telephoto) side of the power zoom button until the zooming stops. **(3)** Turn the focus ring to achieve a sharp focus. **(4)** Set the desired shot length using the power zoom button.



To Shoot with Autofocus Momentarily

When you want to switch to autofocus momentarily while recording in manual focus mode, push FOCUS down to PUSH AUTO. Autofocus functions while FOCUS is held down. When it is released, manual focus mode will be resumed.



To Return to Autofocus Mode

Set FOCUS to AUTO. The Ⓕ indicator in the viewfinder disappears.

Shooting in relatively dark places

Shoot at wide-angle after focusing in the telephoto position.

Note on the focus ring

The focus ring does not have a stop position.

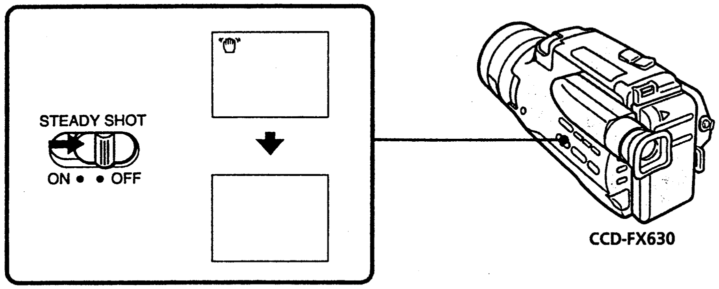
Releasing the STEADY SHOT Function

— For models with the STEADY SHOT switch (CCD-FX630 only)

When you shoot, the indicator appears in the viewfinder. This indicates that the Steady Shot function is working and the camcorder compensates for camera-shake.

You can release the steady shot function when you do not need to use the Steady Shot function. Do not use the steady shot function when shooting a stationary object with a tripod.

Set STEADY SHOT to OFF.


STEADY SHOT
ON • • OFF
CCD-FX630

To Activate the Steady Shot Function again

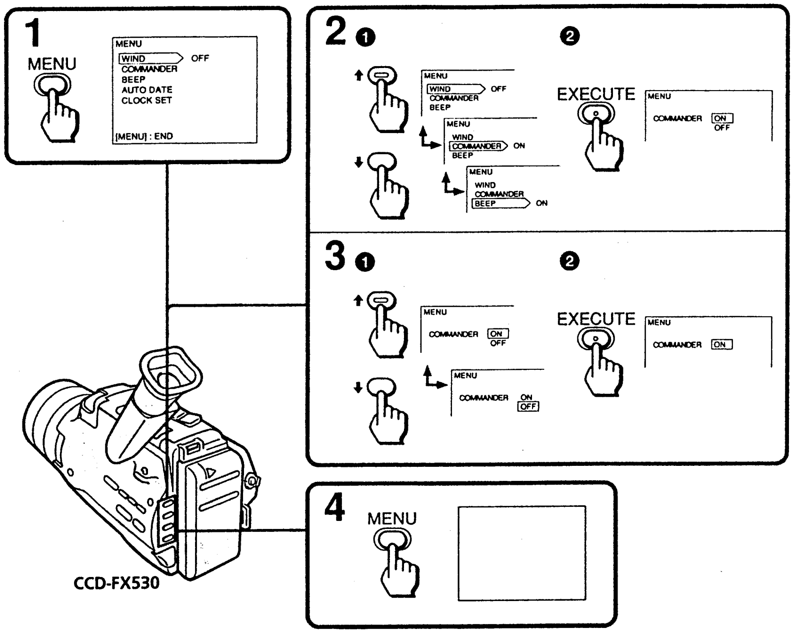
Set STEADY SHOT to ON.

Notes on the Steady Shot Function

- The Steady Shot function will not correct excessive camera-shake.
- When you switch the STEADY SHOT function on or off, the exposure may fluctuate.

Changing the Mode Settings

You can change the mode settings in the menu system to further enjoy the features and functions of the camcorder.
(1) Press MENU to display the menu in the viewfinder. **(2)** Press ↑ or ↓ to select the desired item, then press EXECUTE. **(3)** Press ↑ or ↓ to set the desired mode, then press EXECUTE. If you want to change the other modes, repeat steps 2 and 3. **(4)** Press MENU to erase the menu display.


1
MENU
MENU
WIND OFF
COMMANDER
BEEP
AUTO DATE
CLOCK SET
[MENU] : END
2 ❶
❷
EXECUTE
MENU
WIND OFF
COMMANDER
BEEP
MENU
WIND
COMMANDER ON
BEEP
MENU
WIND
COMMANDER
BEEP ON
MENU
COMMANDER ON OFF
3 ❶
❷
EXECUTE
MENU
COMMANDER ON OFF
MENU
COMMANDER ON OFF
MENU
COMMANDER ON
4
MENU
CCD-FX530

Note on BACK UP
When the BACK UP indicator appears on the menu display, the settings are retained even when the battery is removed, as long as the lithium battery is in place.

Selecting the Mode Setting of Each Item

Item for both PLAYER and CAMERA Mode

BEEP <ON/OFF>
- Select ON to turn the beep sound on.
- Select OFF to turn the beep sound off.

Items for CAMERA Mode only

WIND <ON/OFF>
— For stereo model (**CCD-FX530** only)
- Select ON when recording in a strong wind. The indicator appears in the viewfinder and noise from the wind will be reduced.
- Normally select OFF.

(to be continued)

Changing the Mode Settings

AUTO DATE <ON/OFF>
- Select ON to record the date for 10 seconds after recording has started.
- Select OFF to not record the date.

COMMANDER <ON/OFF>
- Select ON when using the supplied Remote Commander for the camcorder.
- Select OFF when not using the Remote Commander.

CLOCK SET
- Select this item to reset the date or time.

Items for PLAYER Mode only

EDIT <ON/OFF>
- Select ON to minimize picture deterioration when editing.
- Normally select OFF.

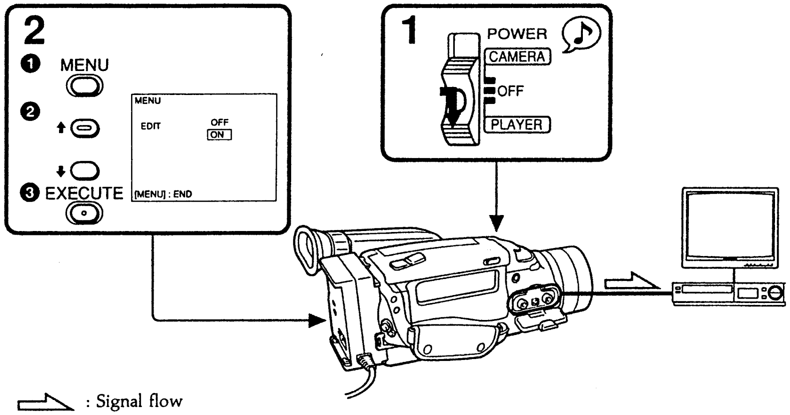
HiFi SOUND <STEREO/1/2>
— For stereo model (**CCD-FX530** only)
- Normally select STEREO.
- Select 1 or 2 to play back a dual sound track tape.

Editing onto Another Tape

You can create your own video program by editing with any other 8 8 mm, Hi8 Hi8, VHS VHS, SVHS S-VHS, VHSC VHSC, SVHSC S-VHSC, B Betamax or ED Beta ED Betamax VCR that has audio/video inputs.

Before Editing

Connect the camcorder to the VCR using the A/V connecting cable (**CCD-FX530**: supplied, **CCD-FX430/FX435/FX630**: not supplied). (p. 16)
Set the input selector on the VCR to LINE, if available.
(1) Set the POWER switch to PLAYER. **(2)** Set EDIT to ON in the menu system (p. 32).



If your VCR is a monaural type, connect only the white plug for audio on both the camcorder and VCR.

Starting Editing

(1) Insert a blank tape (or a tape you want to record over) into the VCR, insert your recorded tape into the camcorder. **(2)** Play back the recorded tape on the camcorder until you locate the point where you want to start editing, then set the camcorder in the Playback pause mode. **(3)** On the VCR, locate the recording start point and set the VCR in the recording pause mode. **(4)** Press ‖ on the camcorder and VCR simultaneously to start editing.

To Edit More Scenes

Repeat steps 2 to 4.

To Stop Editing

Press □ on both the camcorder and the VCR.

Use of the EDITSEARCH button

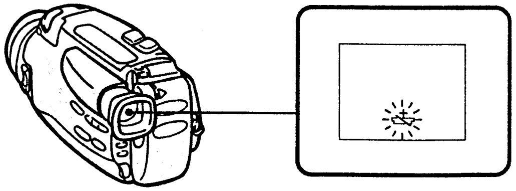
You can play back the tape in normal/reverse direction by holding down EDITSEARCH during Playback pause mode. You can also play back still pictures successively at specific intervals by pressing EDITSEARCH intermittently.

Note on the DISPLAY function

If you have displayed the viewfinder screen indicators on the TV, erase the indicators by pressing DISPLAY on the Remote Commander so that they will not be superimposed on the edited tape.

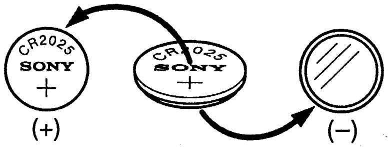
Changing the Lithium Battery

Your camcorder is supplied with a lithium battery installed. The lithium battery for the camcorder lasts for about 1 year under normal operation. When the battery becomes weak or dead, the ⏚ indicator flashes in the viewfinder for about 5 seconds when you set the POWER switch to CAMERA. In this case, **replace the battery with a Sony CR2025 or Duracell DL-2025 lithium battery. Use of any other battery may present a risk of fire or explosion.**



Note on Lithium Battery

The lithium battery has a positive (+) side and a negative (–) side as illustrated. Be sure to insert the lithium battery with the positive side facing out.


CR2025
SONY
+
(+)
(–)

WARNING

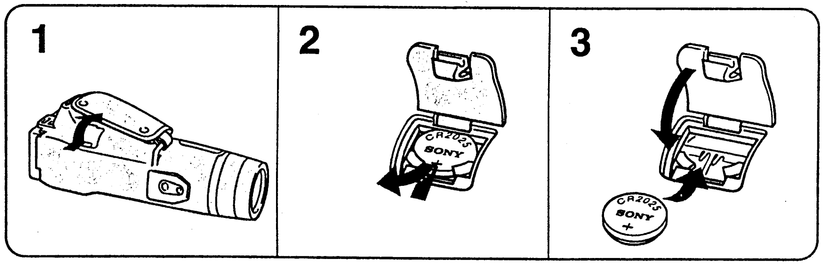
The battery may explode if mistreated. Do not recharge, disassemble, or dispose of in fire.

Caution

Keep the lithium battery out of the reach of children. Should the battery be swallowed, consult a doctor immediately.

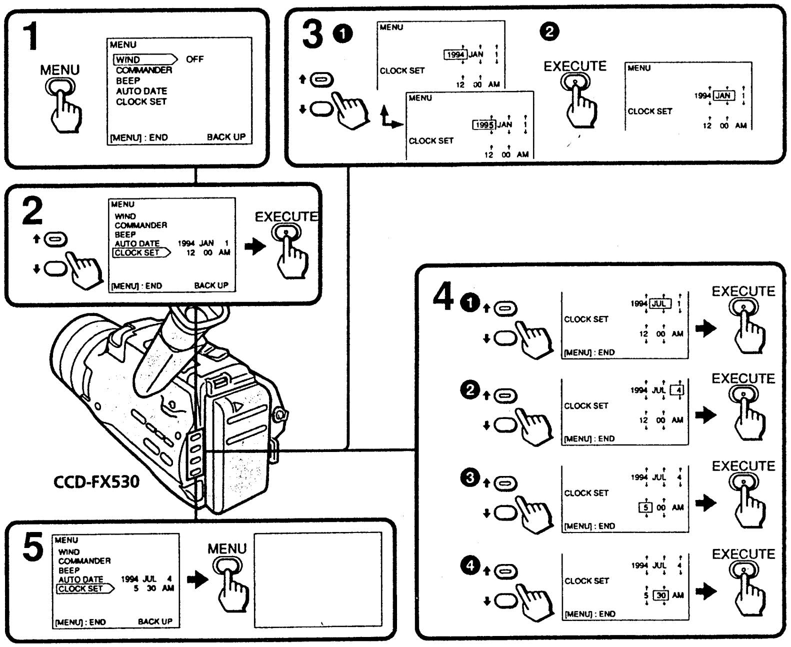
Changing the Lithium Battery

When replacing the lithium battery, keep the battery pack or other power source attached. Otherwise, you will need to reset the date, time, age and other BACK UP items in the menu system.
(1) Open the lid of lithium battery compartment under the grip strap of the camcorder. **(2)** Push the battery down once and pull it out from the holder. **(3)** Install the lithium battery with the positive (+) side facing out. Close the lid.


1
2
3
CR2025
SONY
+

Resetting the Date or Time

You can reset the date or time in the menu system.
(1) Press MENU to display the menu in the viewfinder. **(2)** Select CLOCK SET, then press EXECUTE. **(3)** Press ⬆ or ⬇ to adjust the year, and then press EXECUTE. **(4)** Press ⬆ or ⬇ to adjust the month, day, hour and minutes, and then press EXECUTE. Note that when you keep ⬆ or ⬇ pressed, the indications in the menu display advance faster. **(5)** Press MENU to erase the menu display.


1
MENU
MENU
WIND OFF
COMMANDER
BEEP
AUTO DATE
CLOCK SET
[MENU] : END
BACK UP
2
EXECUTE
CLOCK SET 1994 JAN 1 12 00 AM
3 ❶
CLOCK SET 1994 JAN 12 00 AM
CLOCK SET 1995 JAN 12 00 AM
❷
EXECUTE
4 ❶
1994 JUL
❷
1994 JUL 4
❸
5 00 AM
❹
5 30 AM
EXECUTE
CCD-FX530
5
1994 JUL 4 5 30 AM
MENU

To Check the Preset Date and Time

Press DATE (+) to display the date indicator in the viewfinder.
Press TIME (NEXT) to display the time indicator. When you press the same button again, the indicator goes off.

Note on the setting of the year

When you set the year, each time you press DATE (+) the digits change as follows.

1994 → 1995 → ---- → 2024

Note on the time indicator

The internal clock of this camcorder operates on a 12-hour cycle.
12:00 AM stands for midnight.
12:00 PM stands for noon.

Playback Modes

The playback mode (SP or LP) is selected automatically according to the format in which the tape has been recorded. The quality of the recorded picture in LP mode, however, will not be as good as that in SP mode.

Note on AFM Hi-Fi stereo — For stereo model (CCD-FX530 only)
When you play back a tape, the sound will be in monaural if:
- You record the tape using this camcorder, then play it back on an AFM Hi-Fi monaural video recorder/player.
- You record the tape on an AFM Hi-Fi monaural video recorder, then play it back on this camcorder.

LP (long play) mode
When you play back a tape recorded in LP mode, the LP indicator lights up in the viewfinder. This camcorder cannot record a tape in LP mode.

Foreign 8 mm video
You cannot play back software recorded on a different TV color system. Because the TV color systems differ from country to country, you may not be able to play back foreign pre-recorded software. Refer to page 43 to check the TV color system of foreign countries.

Tips for Using the Battery Pack

This section shows you how you can get the most out of your battery pack.

Preparing the Battery Pack

Always Carry Additional Batteries

Have sufficient battery pack power to do 2 to 3 times as much recording as you have planned.

Battery Life is Shorter in Cold Environment

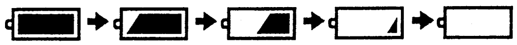
Battery efficiency is decreased and the battery will be used up more quickly if you are recording in a cold environment.

To Save Battery Power

Turn STANDBY on the camcorder down when not recording to save battery power. (p. 38) **[a]**
A smooth transition between scenes can be made even if recording is stopped and started again.
While you are positioning the subject, selecting an angle, or looking through the viewfinder lens, the lens moves automatically and the battery is used. The battery is also used when a tape is inserted or removed.

When to Replace the Battery Pack

While you are using your camcorder, the remaining battery indicator in the viewfinder decreases gradually as battery power is used up.



When the remaining battery indicator reaches the lowest point, the ▭ indicator appears and starts flashing in the viewfinder. (p. 38) **[b]**
When the ▭ indicator in the viewfinder changes from slow flashing to rapid flashing while you are recording, slide the POWER switch to OFF on the camcorder and replace the battery pack. Leave the tape in the camcorder to obtain a smooth transition between scenes after the battery pack is replaced.

Note on the remaining battery indicator
The remaining battery indicator of the camcorder may indicate a different remaining capacity from that of the battery pack with its own indicator (not supplied). The indicator on the battery pack is more accurate.

Notes on the Rechargeable Battery Pack

The Battery Pack Heats Up

During charging or recording, the battery pack heats up. This is caused by energy that has been generated and a chemical change that has occurred inside the battery pack. This is not cause for concern.

Battery Pack Care

- Remove the battery pack from the camcorder after using the battery pack, and keep it in a cool place. When the battery pack is attached to the camcorder, a small amount of current flows to the camcorder even if the POWER switch is set to OFF, which shortens battery life.
- The battery pack is always discharging even when it is not in use after charging. Therefore, you should charge the battery pack right before using the camcorder.

How to Use the Switch on the Battery Pack

This switch is provided so that you can mark the charged battery pack. Set the switch to the "no mark" position when charging is completed. Set the switch to the "red mark" position when the battery is used up (or in whichever direction you want to remind yourself). (p. 38) **[c]**

The Life of the Battery Pack

The battery pack can be fully charged and discharged about 500 times under normal temperatures. If the battery indicator flashes rapidly just after turning on the camcorder with a fully charged battery pack, the battery pack should be replaced with a new fully charged one.

Charging Temperature

You should charge batteries at temperatures from 50°F to 86°F (from 10°C to 30°C). Lower temperature require a longer charging time.

Tips for Using the Battery Pack

Notes on Charging

A Brand-new Battery Pack

A brand-new battery pack is not charged. Before using the battery pack, charge it completely.

Before Recharging a Used Battery Pack

- Make sure to use up the battery before recharging.
- If recording is completed before the 🪫 indicator appears in the viewfinder, you should remove the tape, slide the POWER switch to CAMERA, turn STANDBY up, and leave the camcorder until the battery indicator flashes rapidly.
- When you use the AC-S10 power adaptor or the BC-S10 portable battery charger, you can use the discharging function.
- **Charging a usable battery pack causes a lowering of battery capacity. Battery capacity can be recovered if you fully discharge and charge the battery pack again.**

After Long Storage

Recharge the battery pack after a long period of storage. If the battery pack is charged fully but not used for a long time (about 1 year), it becomes discharged. Charge it again, but in this case the battery life will be shorter than normal. After several charging and discharging cycles, the battery life will recover its original capacity.

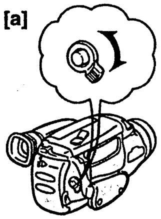
Notes on the Terminals

If the terminals (metal parts on the back) are not clean, the battery duration will be shortened.
When the terminals are not clean or when the battery pack has not been used for a long time, repeatedly install and remove the battery pack. This improves the contact condition. Also, wipe the + and − terminals with a soft cloth or paper.

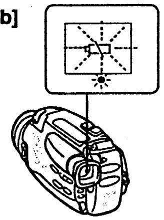
Be Sure to Observe the Following

- **To prevent an accident caused by a short circuit, do not allow metal objects such as a necklace to touch the battery terminals. When carrying the battery pack, attach the terminal cover. [d]**
- Keep the battery pack away from fire.
- Keep the battery pack dry.
- Do not open nor convert the battery pack.
- Do not expose the battery pack to any mechanical shock.

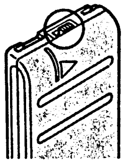
[a]



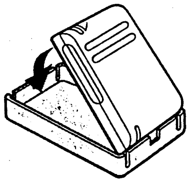
[b]



[c]



[d]



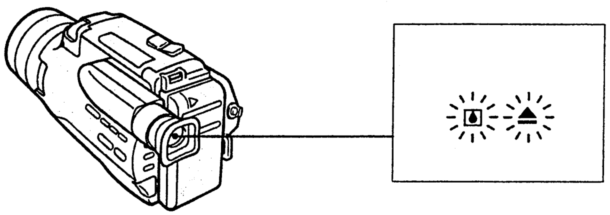
Maintenance Information and Precautions

Moisture Condensation

If the camcorder is brought directly from a cold place to a warm place, moisture may condense inside the camcorder, on the surface of the tape, or on the lens. In this condition, the tape may stick to the head drum and be damaged or the unit may not operate correctly. To prevent possible damage under these circumstances, the camcorder is furnished with moisture sensors. However, take the following precautions.

Inside the Camcorder

When the ▣ and ⏏ indicators flash in the viewfinder, moisture has condensed inside the camcorder. If this happens, no other functions except for tape ejection will work.
Eject the tape, turn off the camcorder and leave it with the cassette holder open for at least one hour. The camcorder can be used again if the ▣ indicator does not appear when the power is turned on again.



On the Surface of the Tape

If there is moisture on the surface of the tape, when you insert the cassette and press a tape transport button (▷ PLAY, etc.), the ⏏ indicator in the viewfinder flashes.
In this case, no other functions except for tape ejection will work.
Eject the tape, turn off the camcorder and leave it with the cassette holder open for at least one hour. The camcorder can be used again if the ⏏ indicator does not appear when you insert the cassette and press one of the tape transport buttons.

On the Lens

If moisture condenses on the lens, no indicator appears, but the picture becomes dim. Turn off the power and do not use the camcorder for about one hour.

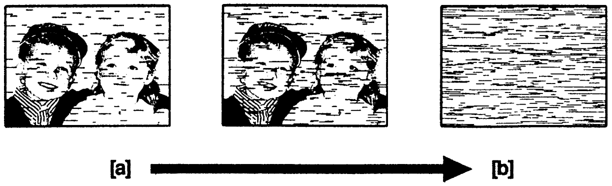
How to Prevent Moisture Condensation

When bringing the camcorder from a cold place to a warm place, put the camcorder in a plastic bag and allow it to adapt to room conditions over a period of time.
(1) Be sure to tightly seal the plastic bag containing the camcorder. **(2)** Remove the bag when the air temperature inside it has reached the temperature surrounding it (after about 1 hour).

Maintenance Information and Precautions

Video Head Cleaning

To ensure normal recording and clear pictures, clean the video heads often. When the ⊗ indicator in the viewfinder flashes or playback pictures are "noisy" or hardly visible, the video heads may be dirty.



[a] Slightly dirty
[b] Very dirty

If this happens, clean the video heads with the Sony V8-25CLH cleaning cassette (not supplied). After checking the picture, if it is still "noisy", repeat the cleaning. (Do not repeat cleaning more than 5 times.)

Caution

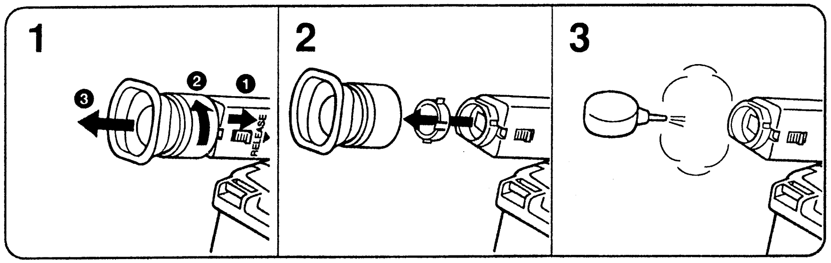
Do not use a commercially available wet-type cleaning cassette. It may damage the video heads.

Note

If the V8-25CLH cleaning cassette is not available in your area, consult your nearest Sony dealer.

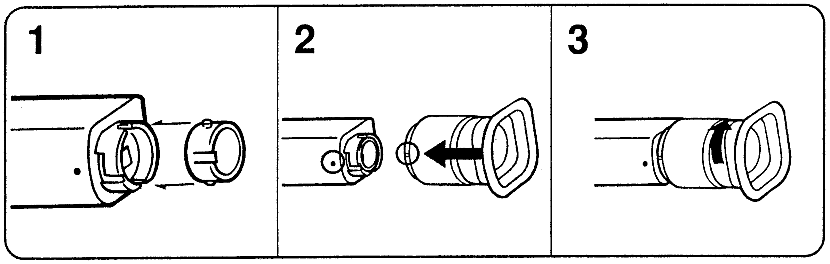
Removing Dust from Inside the Viewfinder

(1) While holding down the switch on the viewfinder barrel, turn the eyecup in the direction of the arrow and pull it out. **(2)** Remove the small lens from inside the viewfinder. **(3)** Clean the surface with a commercially available blower.



To Reattach the Eyecup

(1) Replace the small lens inside the viewfinder. Be sure to replace it with the correct side. **(2)** Align the groove on the eyecup with the ● mark on the barrel. **(3)** Turn the eyecup clockwise.



Precautions

Camcorder Operation

- Operate the camcorder on 6.0 V (battery pack) or 7.5 V (AC power adaptor).
- For DC or AC operation, use the accessories recommended in this manual.
- Should any solid object or liquid get inside the casing, unplug the camcorder and have it checked by Sony dealer before operating it any further.
- Avoid rough handling or mechanical shock. Be particularly careful of the lens.
- Keep the POWER switch set to OFF when not using the camcorder.
- Do not wrap up the camcorder and operate it since heat may build up internally.
- Keep the camcorder away from strong magnetic fields or mechanical vibration.

Maintenance Information and Precautions

On Handling Tapes

Do not insert anything in the small holes on the rear of the cassette. These holes are used to sense the type, thickness of tape, if the tab is out or in, etc.

Camcorder Care

- When the camcorder is not to be used for a long time, disconnect the power source and remove the tape. Periodically turn on the power, operate the camera and player sections and play back a tape for about 3 minutes.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on it, remove them with a soft cloth.
- Clean the camcorder body with a dry soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.

AC Power Adaptor

Charging

- **Repeated charging while some capacity remains causes a lowering of battery capacity. However, the original battery capacity can be recovered if you use the battery completely and charge it fully again.**
- Charge the battery pack on a flat surface without vibration.
- The battery pack will get hot during charging. This is normal.

Others

- Model for the USA and Canada: One blade of the plug is wider than the other for safety purposes and will fit into the power outlet only one way. If you are unable to insert the plug fully into the outlet, contact your dealer.
- Unplug the unit from the wall (mains) outlet when not in use for a long time. To disconnect the cord (mains lead), pull it out by the plug. Never pull the cord itself.
- Do not operate the unit with a damaged cord or if the unit has been dropped or damaged.
- Do not bend the AC power cord forcibly, or put a heavy object on it. This will damage the cord and may cause a fire or an electrical shock.
- Be sure that nothing metallic comes into contact with the metal parts of the connecting plate. If this happens, a short may occur and the unit may be damaged.
- Always keep the metal contacts clean.
- Do not disassemble the unit.
- Do not apply mechanical shock or drop the unit.
- While the unit is in use, particularly during charging, keep it away from AM receivers and video equipment because it will disturb AM reception and video operation.
- The unit becomes warm while in use. This is normal.
- Do not place the unit in locations that are:
  - – Extremely hot or cold
  - – Dusty or dirty
  - – Very humid
  - – Vibrating

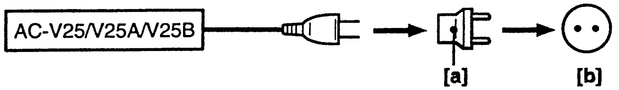
If any difficulty should arise, unplug the unit and contact your nearest Sony dealer.

Using Your Camcorder Abroad

Each country has its own electric and TV color systems. Before using your camcorder abroad, check the following points.

Power Sources

You can use your camcorder in any country with the supplied AC power adaptor within 110 V to 240 V AC, 50/60 Hz.
Use a commercially available AC plug adaptor **[a]**, if necessary, depending on the design of the wall outlet **[b]**.



Difference in Color Systems

This camcorder is an NTSC system based camcorder. If you want to view the playback picture on a TV, it must be an NTSC system based TV or a PAL-M system based TV with an NTSC/PAL-M transcoder.
Check the following list.

NTSC system countries
Bahama Islands, Bolivia, Canada, Central America, Chile, Colombia, Ecuador, Jamaica, Japan, Korea, Mexico, Peru, Surinam, Taiwan, the Philippines, the U.S.A., Venezuela, etc.

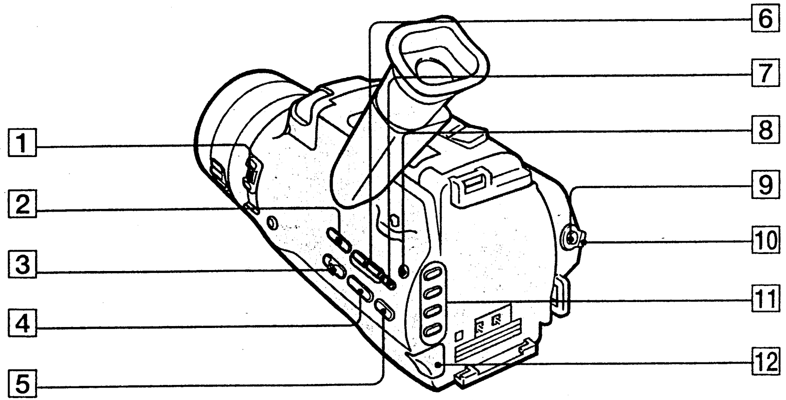
PAL system countries
Australia, Austria, Belgium, China, Denmark, Finland, former West Germany, Great Britain, Holland, Hong Kong, Italy, Kuwait, Malaysia, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, etc.

PAL-M system country
Brazil

PAL-N system countries
Argentina, Paraguay, Uruguay

SECAM system countries
Bulgaria, France, Guiana, Hungary, Iran, Iraq, Monaco, Poland, former Soviet Union, etc.

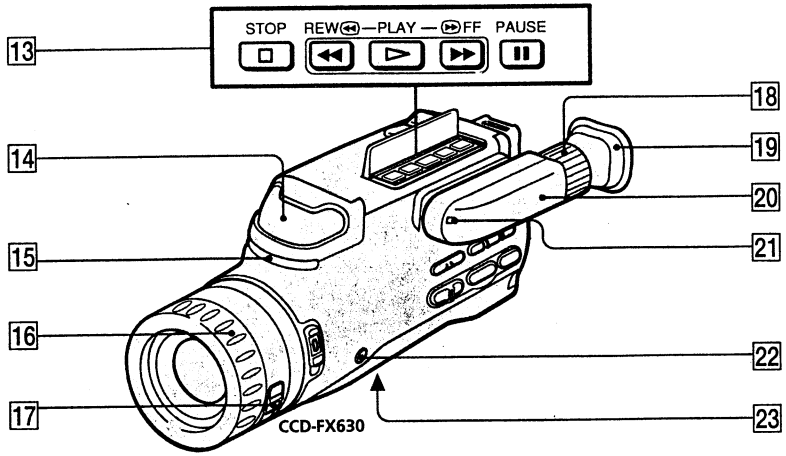
Identifying the Parts



CCD-FX630

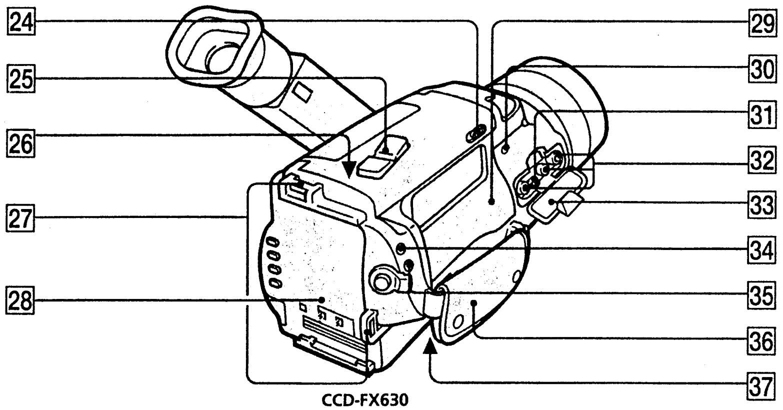
- [1] **POWER switch** (p. 11, 18)
- [2] **EDITSEARCH button** (p. 15)
- [3] **STEADY SHOT switch (CCD-FX630 only)** (p. 30)
- [4] **PROGRAM AE button** (p. 26)
- [5] **BACK LIGHT button** (p. 25)
- [6] **DATE (+) and TIME (NEXT) buttons** (p. 21)
- [7] **AGE/EVENT button** (p. 22)
- [8] **COUNTER RESET button** (p. 12)
- [9] **START/STOP button** (p. 11)
- [10] **STANDBY switch** (p. 11)
- [11] **Menu operation buttons** (p. 31)
- [12] **BATT (battery eject) knob** (p. 8)

Identifying the Parts



CCD-FX630

- [13] **Tape transport buttons** (p. 18)
  - □ (stop)
  - ◀◀ REW (rewind)
  - ▷ (playback)
  - ▶▶ FF (fastforward)
  - II PAUSE
- [14] **Built-in microphone**
- [15] **Remote sensor** (p. 54)
  Aim the Remote Commander here for remote control.
- [16] **Focus ring (CCD-FX630 only)** (p. 28)
- [17] **FOCUS switch (CCD-FX630 only)** (p. 28)
- [18] **Viewfinder lens adjustment ring** (p. 10)
- [19] **Eyecup**
- [20] **Viewfinder** (p. 10)
- [21] **Camera recording/battery lamp**
- [22] **FADER button (CCD-FX435/FX530/FX630)** (p. 27)
- [23] **Tripod receptacle** (p. 14)

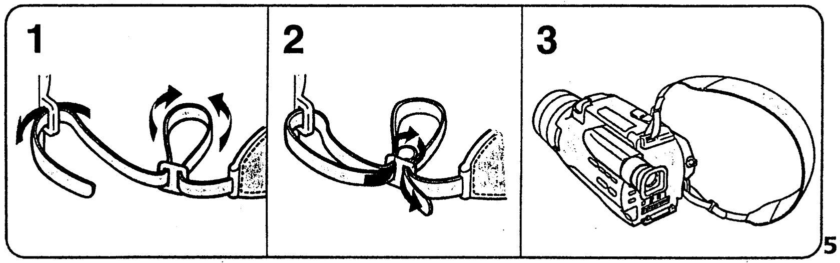


CCD-FX630

- 24 **Lid lock** (p. 9)
- 25 **Power zoom button** (p. 13)
- 26 **Eject button (under the cover)** (p. 9)
- 27 **Hooks for shoulder strap** (See below.)
- 28 **Battery mounting surface** (p. 8)
- 29 **Cassette compartment** (p. 9)
- 30 **MIC jack (PLUG IN POWER)**
  Connect an optional external microphone. This jack also accepts a "plug-in-power" microphone.
- 31 **RFU DC OUT (RFU adaptor DC output) jack** (p. 16)
- 32 **Audio/Video output jacks** (p. 16)
- 33 **Jack cover**
- 34 **LANC Ⓛ control jack**
  Ⓛ stands for Local Application Control Bus System. The Ⓛ control jack is used for controlling the tape transport of video equipment and peripherals connected to it. This jack has the same function as the jack indicated as CONTROL L or REMOTE.
- 35 **👂/🎧 (Earphone/headphones) jack**
- 36 **Grip strap** (p. 14)
- 37 **Lithium battery compartment** (p. 34)

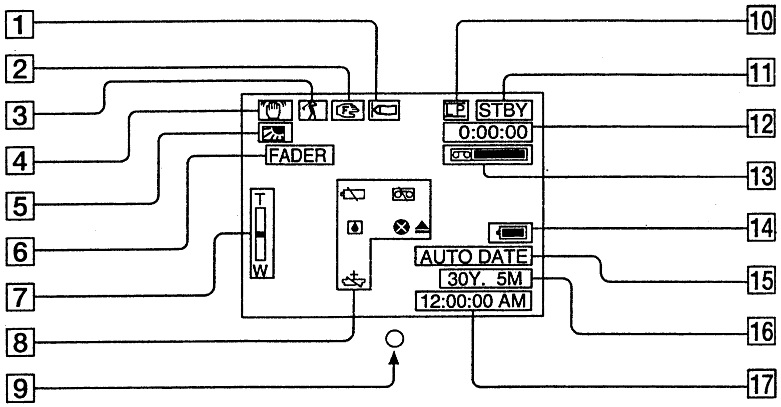
Attaching the Shoulder Strap

Attach the supplied shoulder strap to the hooks for the shoulder strap (27).

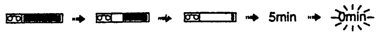


Operation Indicators

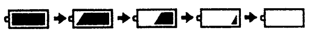
For details on each indicator, refer to the pages indicated in the parentheses.



- 1 WIND indicator (p. 31)
- 2 Manual focusing (**CCD-FX630** only) (p. 28)
- 3 PROGRAM AE indicator (p. 26)
- 4 Steady Shot indicator (**CCD-FX630** only) (p. 30)
- 5 Back Light indicator (p. 25)
- 6 FADER indicator (**CCD-FX435/FX530/FX630**) (p. 27)
- 7 Power zoom indicator (p. 13)
- 8 Warning indicators (p. 55)
- 9 Recording lamp/Battery lamp
- 10 Lights up when playing back a tape recorded in LP mode.
- 11 Tape transport mode (p. 11)
- 12 Tape counter (p. 12)
- 13 Remaining tape indicator



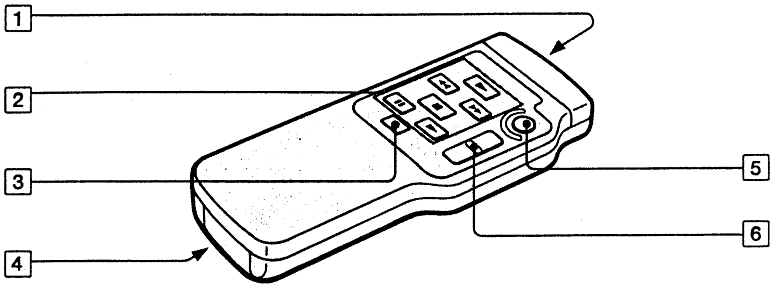
- 14 Remaining battery indicator (p. 37, 55)



- 15 AUTO DATE indicator (p. 11, 12)
- 16 AGE/EVENT indicator (p. 22)
- 17 Date or Time (p. 21)

Remote Commander

The buttons that have the same name on the Remote Commander as on the camcorder function identically.



1 **Transmitter**
Point toward the remote sensor to control the camcorder after turning on the POWER switch on the camcorder.

2 **Tape transport buttons**

3 **DISPLAY button**

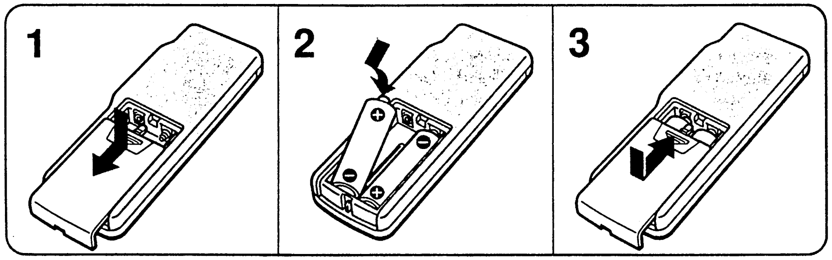
4 **Size AA (R6) battery holder**

5 **START/STOP button**

6 **Power zoom button**
The zooming speed is unchangeable in the Remote Commander.

Preparing the Remote Commander

To use the Remote Commander, you must insert two size AA (R6) batteries. Use the supplied size AA (R6) batteries.
(1) Remove the battery cover from the Remote Commander. **(2)** Insert both of the size AA (R6) batteries with correct polarity. **(3)** Put the battery cover back onto the Remote Commander.

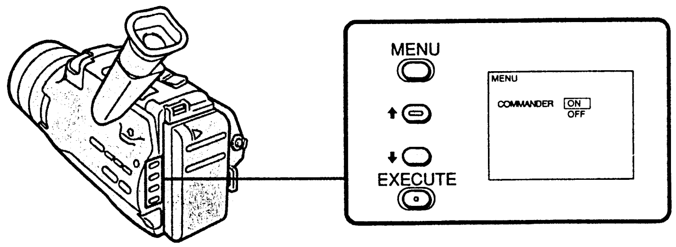


Note on battery life
The batteries for the Remote Commander last about 6 months under normal operation. When the batteries become weak or dead, the Remote Commander does not work.

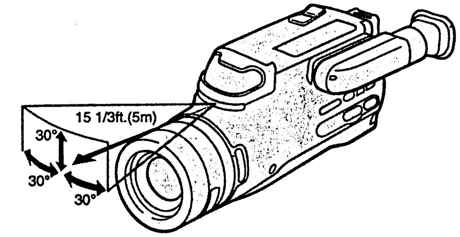
To avoid damage from possible battery leakage
Remove the batteries when you will not use the Remote Commander for a long time.

Using the Remote Commander

Make sure that the COMMANDER mode is set to ON in the menu system.



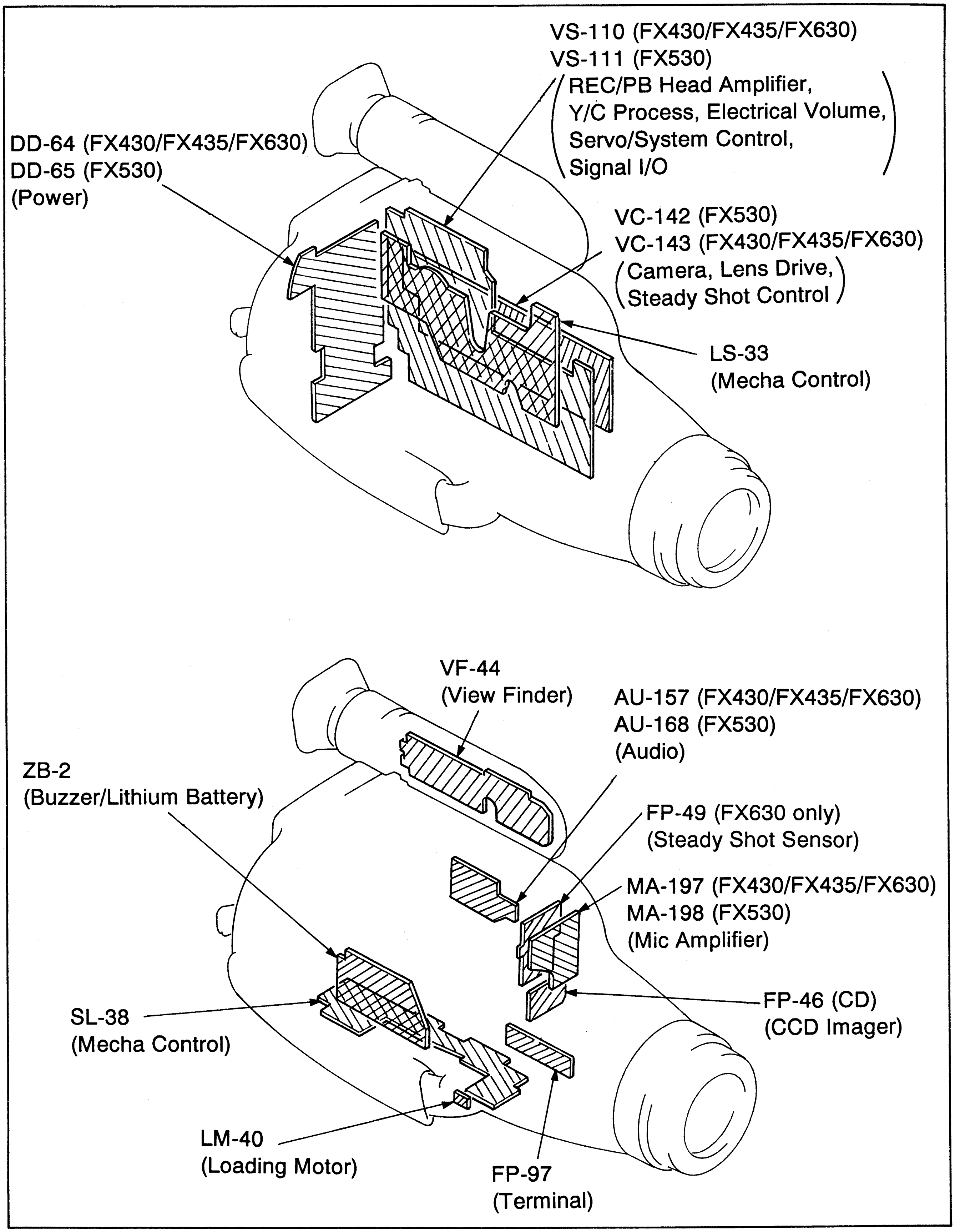
Remote Control Direction



Notes on the Remote Commander

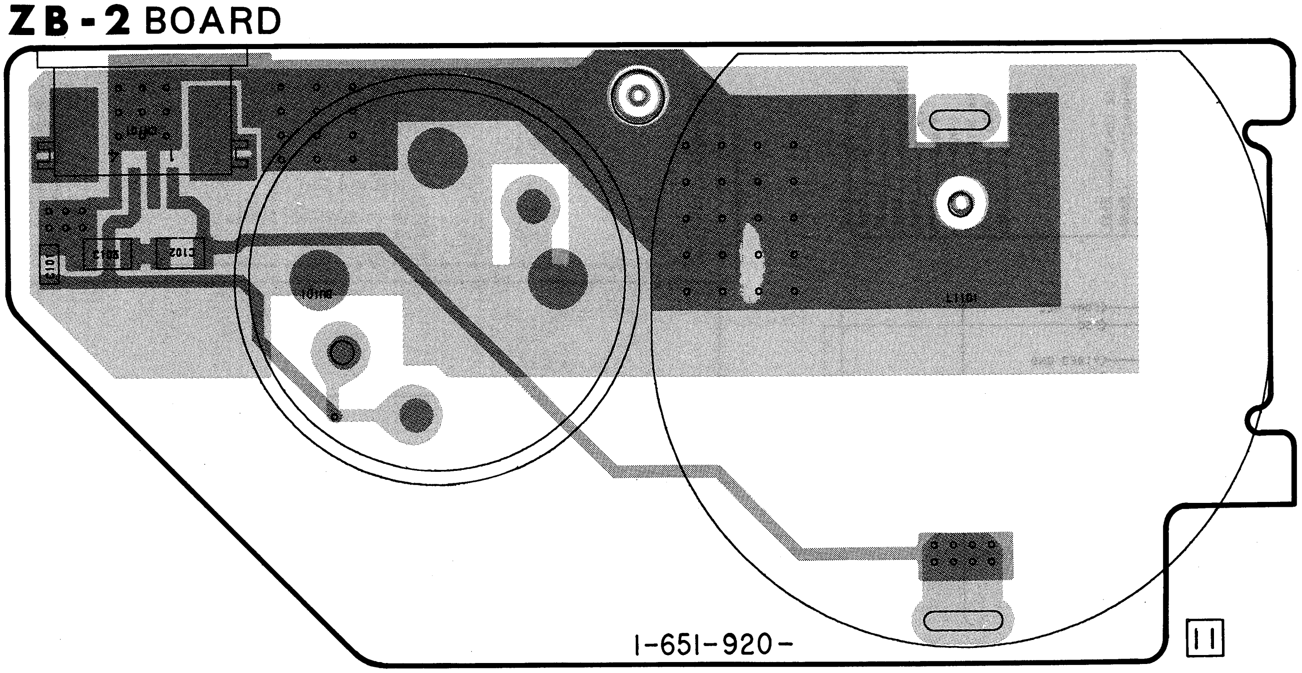
- Keep the remote sensor away from strong light sources such as direct sunlight or illumination. Otherwise, the remote control may not be effective.
- Be sure that there is no obstacle between the remote sensor and the Remote Commander.
- This camcorder works at commander mode VTR 2. The commander modes (1, 2 and 3) are used to distinguish this camcorder from other Sony VCRs to avoid remote control misoperation. If you use another Sony VCR at commander mode VTR 2, we recommend you change the commander mode or cover the remote sensor of the VCR with black paper.

2-13. CIRCUIT BOARDS LOCATION


VS-110 (FX430/FX435/FX630)
VS-111 (FX530)
(REC/PB Head Amplifier,
Y/C Process, Electrical Volume,
Servo/System Control,
Signal I/O)
DD-64 (FX430/FX435/FX630)
DD-65 (FX530)
(Power)
VC-142 (FX530)
VC-143 (FX430/FX435/FX630)
(Camera, Lens Drive,
Steady Shot Control)
LS-33
(Mecha Control)
VF-44
(View Finder)
AU-157 (FX430/FX435/FX630)
AU-168 (FX530)
(Audio)
ZB-2
(Buzzer/Lithium Battery)
FP-49 (FX630 only)
(Steady Shot Sensor)
MA-197 (FX430/FX435/FX630)
MA-198 (FX530)
(Mic Amplifier)
FP-46 (CD)
(CCD Imager)
SL-38
(Mecha Control)
LM-40
(Loading Motor)
FP-97
(Terminal)

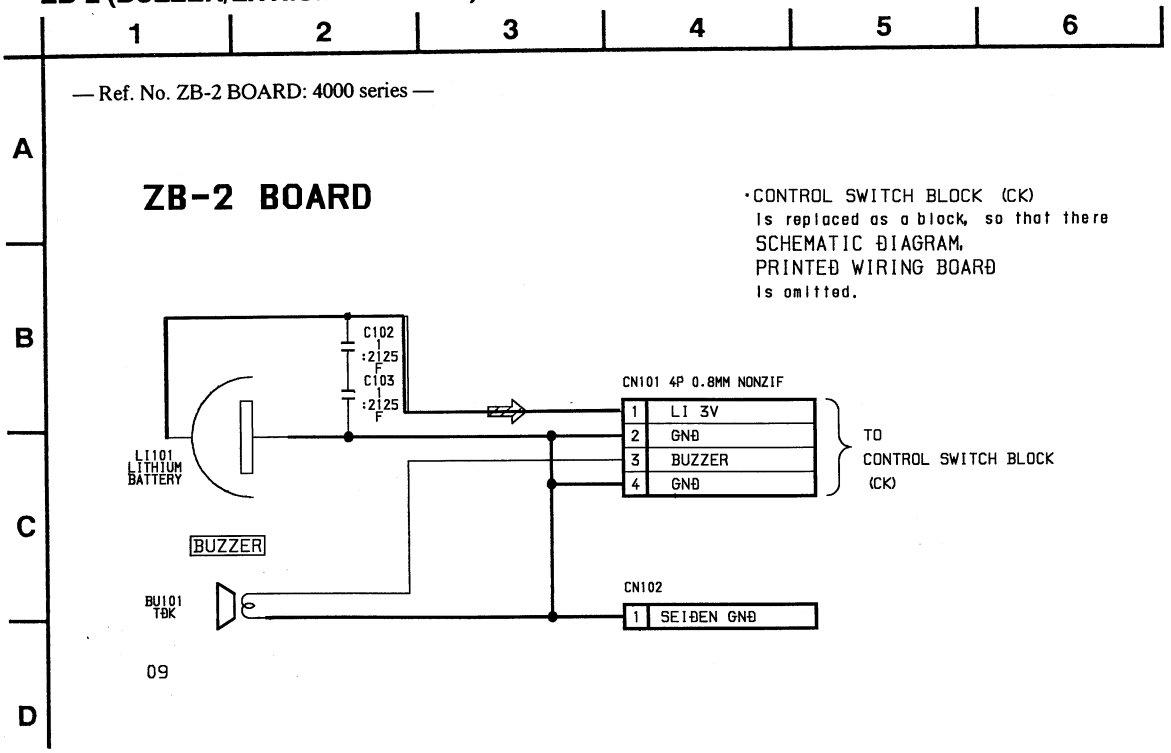
ZB-2 (BUZZER/LITHIUM BATTERY) PRINTED WIRING BOARD

— Ref. No. ZB-2 BOARD: 4000 series —


ZB-2 BOARD
C102
C103
LI101
1-651-920-
11

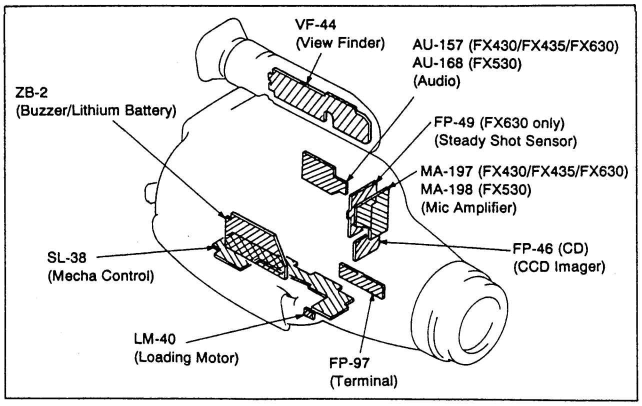
- **For printed wiring board of ZB-2 board.**
- ▨ : Pattern from the side which enables seeing.
- ░ : Pattern of the rear side.

ZB-2 (BUZZER/LITHIUM BATTERY) SCHEMATIC DIAGRAM

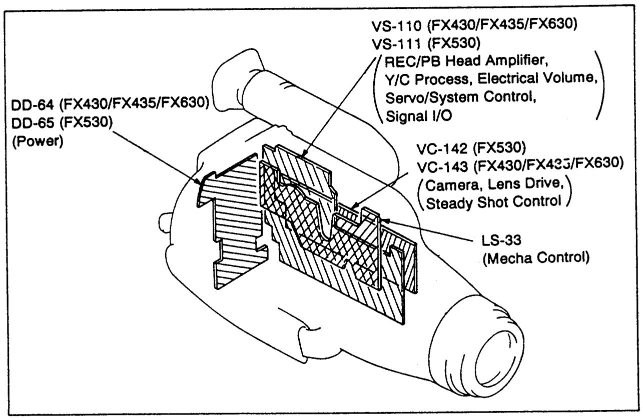

1
2
3
4
5
6
A
B
C
D
ZB-2 BOARD
C102
1
:2125
F
C103
1
:2125
F
LI101
LITHIUM
BATTERY
CN101 4P 0.8MM NONZIF
1 LI 3V
2 GND
3 BUZZER
4 GND
TO
CONTROL SWITCH BLOCK
(CK)
BUZZER
BU101
TDK
CN102
1 SEIDEN GND
09

— Ref. No. ZB-2 BOARD: 4000 series —

·CONTROL SWITCH BLOCK (CK)
Is replaced as a block, so that there
SCHEMATIC DIAGRAM,
PRINTED WIRING BOARD
Is omitted.


VF-44
(View Finder)
AU-157 (FX430/FX435/FX630)
AU-168 (FX530)
(Audio)
ZB-2
(Buzzer/Lithium Battery)
FP-49 (FX630 only)
(Steady Shot Sensor)
MA-197 (FX430/FX435/FX630)
MA-198 (FX530)
(Mic Amplifier)
SL-38
(Mecha Control)
FP-46 (CD)
(CCD Imager)
LM-40
(Loading Motor)
FP-97
(Terminal)

- **For printed wiring boards.**
- DD board is a four-layer print board. However, the patterns of layers 2 to 3 have not been included in the diagram.

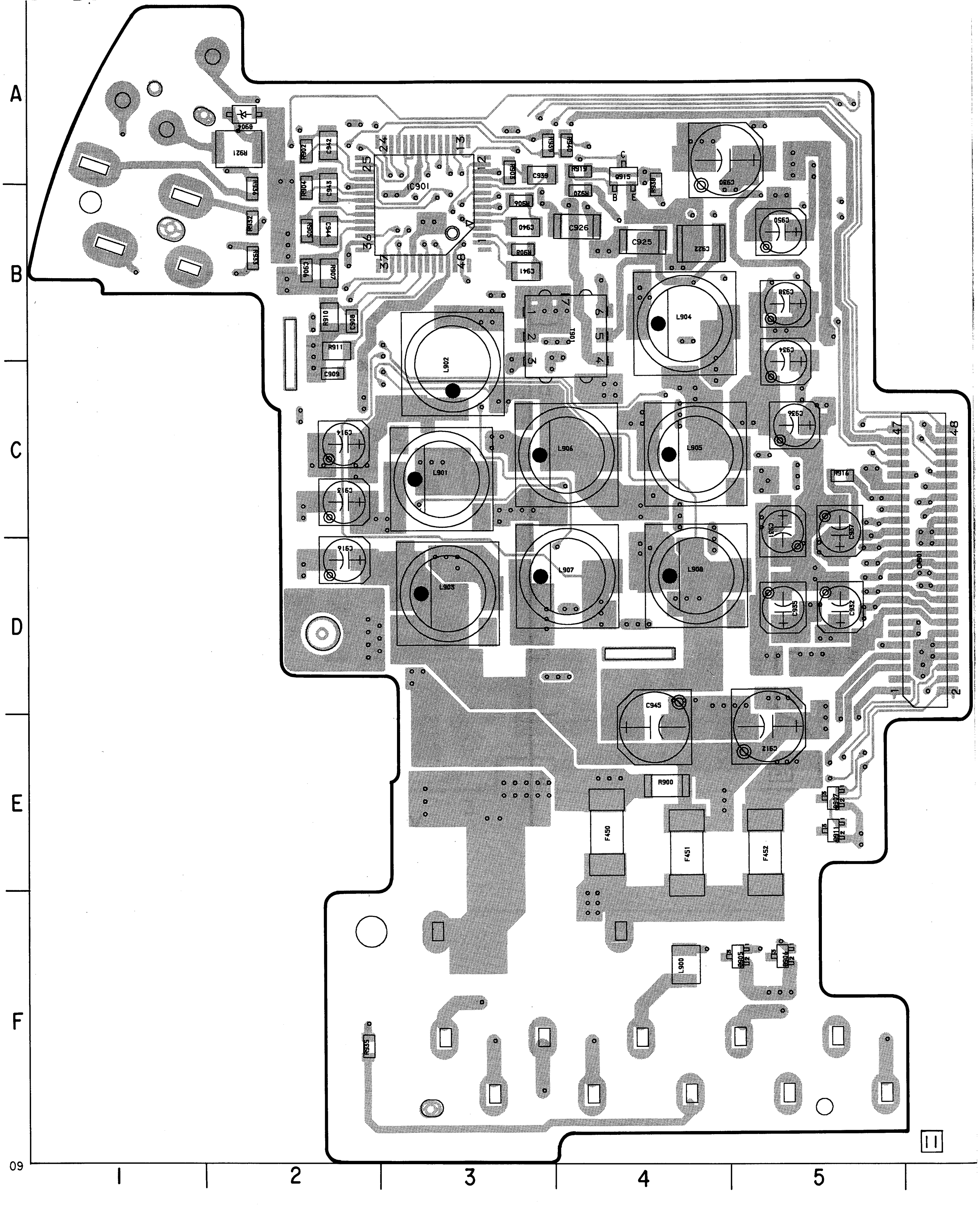

VS-110 (FX430/FX435/FX630)
VS-111 (FX530)
(REC/PB Head Amplifier, Y/C Process, Electrical Volume, Servo/System Control, Signal I/O)
DD-64 (FX430/FX435/FX630)
DD-65 (FX530)
(Power)
VC-142 (FX530)
VC-143 (FX430/FX435/FX630)
(Camera, Lens Drive, Steady Shot Control)
LS-33
(Mecha Control)

DD (POWER) PRINTED WIRING BOARD

— Ref. No. DD BOARD: 9000 series —

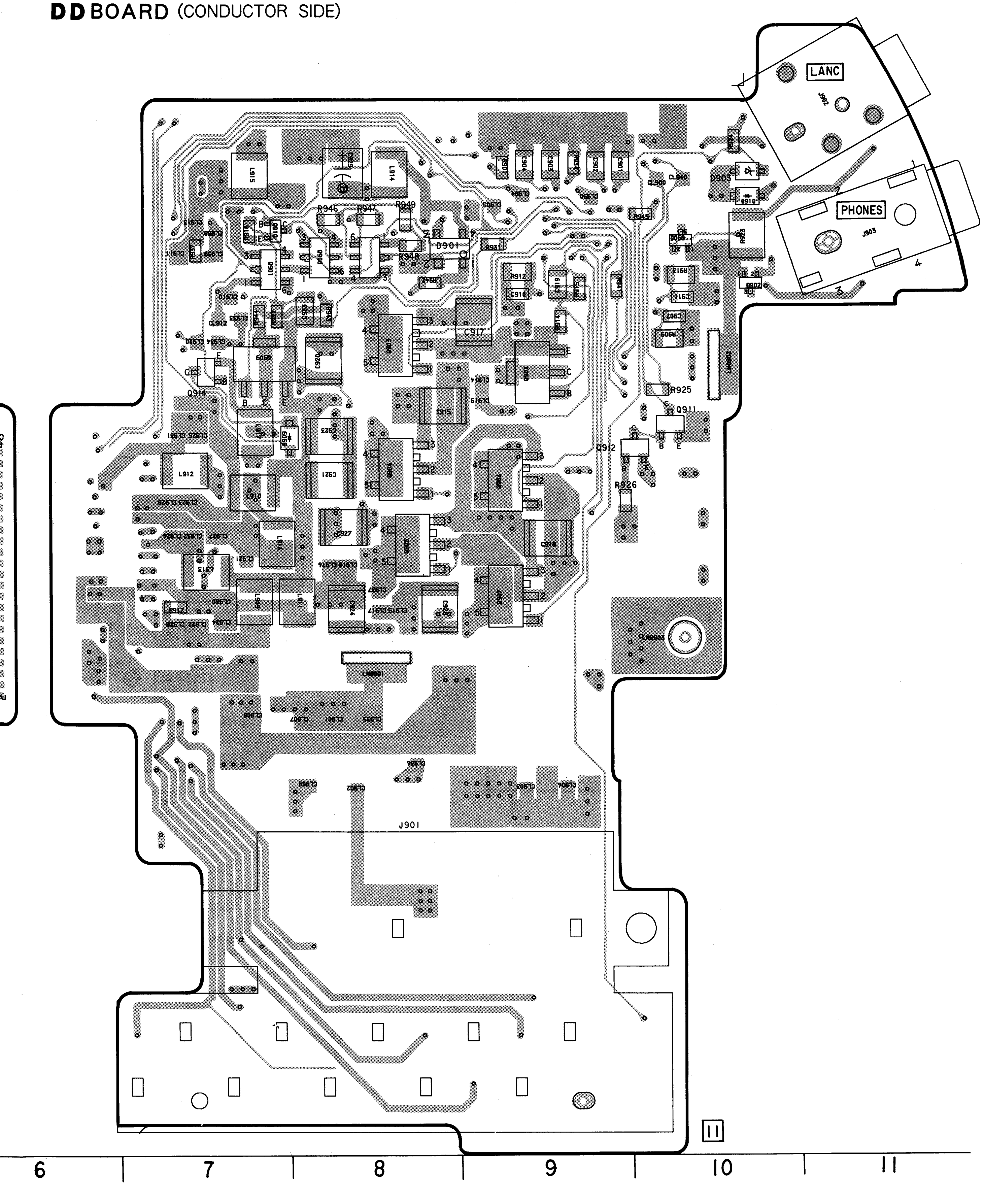
FX430/FX435/FX630 DD-64 1-652-089-11
FX530 DD-65 1-651-941-11

DD BOARD (COMPONENT SIDE)



A
B
C
D
E
F
1
2
3
4
5
09
IC901
24
13
25
12
36
37
48
R921
D904
R936
R932
R933
R902
C942
R904
C943
C944
R907
R910
C908
R911
C909
C939
R919
Q915
C
B
E
R920
C940
C926
C941
C925
C922
C930
C950
L902
L904
T901
1
2
3
4
5
6
7
C938
C934
C936
C914
C913
C916
L901
L906
L905
L903
L907
L908
R914
C937
C935
C932
CN901
47
48
1
2
C945
C912
R900
F450
F451
F452
L900
R935
11

DD BOARD (CONDUCTOR SIDE)


LANC
J902
PHONES
J903
D903
D910
R923
R913
C911
C907
R909
R945
R946
R947
R949
R948
D901
R931
R912
C916
C917
Q909
Q901
Q902
Q903
Q904
Q905
Q906
Q907
Q908
Q911
Q912
Q914
R925
R926
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L916
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C915
C918
C920
C921
C923
C924
C925
C927
C928
R901
C904
C903
C902
C901
CL900
CL940
LND901
LND902
LND903
J901
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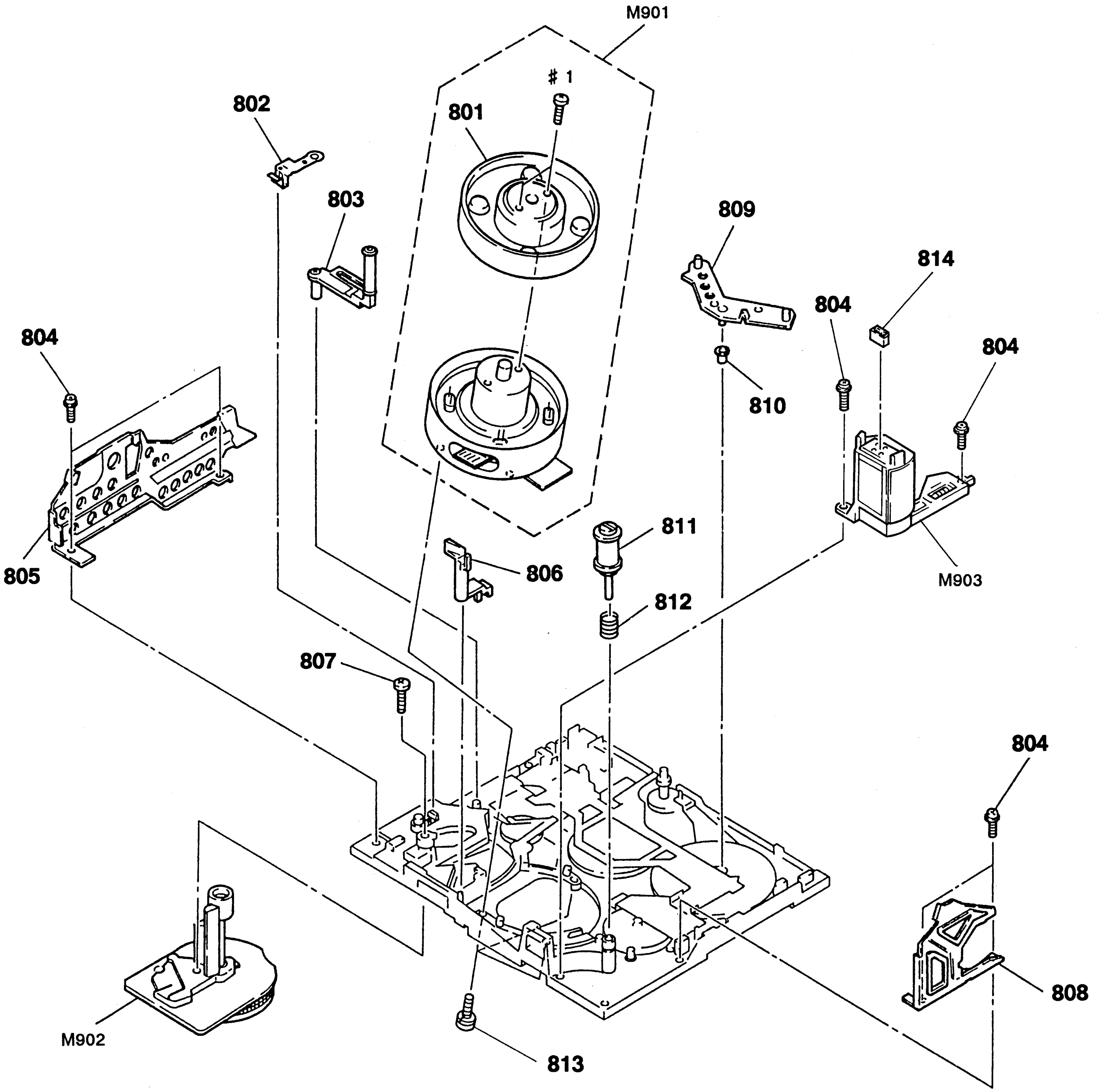
11

5-1-10. MECHANISM CHASSIS ASSEMBLY (1)



M901
#1
802
801
803
809
814
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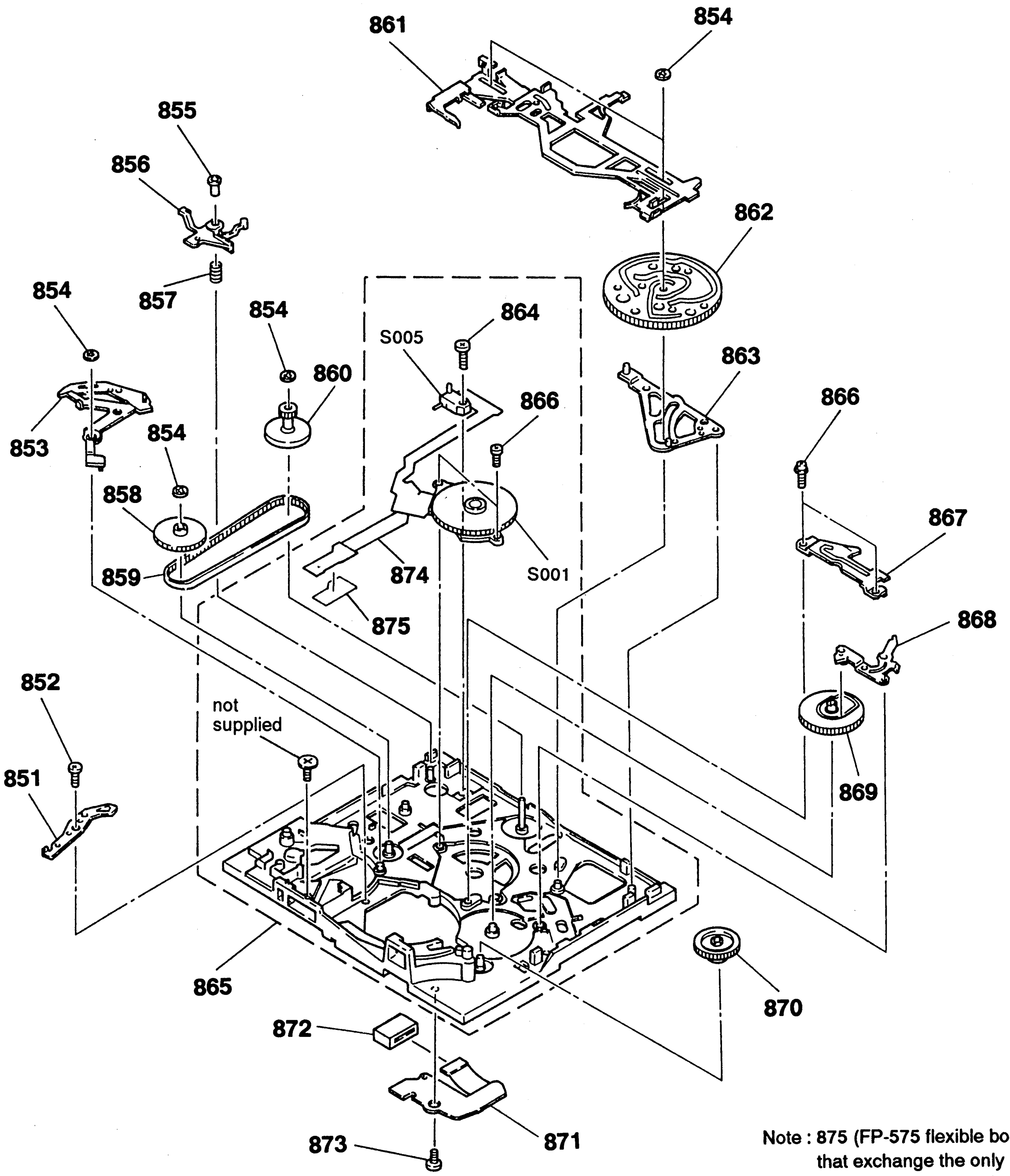
804
804
810
811
805
806
M903
812
807
804
808
M902
813

Ref. No.	Part No.	Description	Remark
801	A-7049-501-A	DRUM ASSY, UPPER (DGR-78-R)	
802	3-945-822-01	SPRING, LEAF, TG7 ARM	
803	A-7040-305-A	ARM BLOCK ASSY, TG7	
804	3-947-503-01	SCREW (M1.4X2.5)	
805	X-3941-255-1	PLATE (T) ASSY, SIDE	
806	3-945-735-01	ARM, HC CONVERSION	
807	3-713-786-71	SCREW (M2X5)	
808	3-945-691-01	PLATE (S), SIDE	
809	3-945-701-01	ARM, LS	

Ref. No.	Part No.	Description	Remark
810	3-945-702-01	ROLLER, LS	
811	X-3941-262-1	ROLLER ASSY, TG2	
812	3-956-651-01	SPRING, COMPRESSION	
813	3-686-493-01	SCREW (M2X5), P1	
814	1-568-323-11	CONNECTOR, BOARD TO BOARD 4P	
M901	A-7048-564-A	DRUM ASSY (DGH-78A-R)	
M902	8-835-477-12	MOTOR, DC SCE-0101A (CAPSTAN)	
M903	A-7040-304-A	MOTOR BLOCK ASSY, LM (LOADING)	

5-1-11. MECHANISM CHASSIS ASSEMBLY (2)


861
854
855
856
862
854
857
854
864
S005
863
860
866
866
853
854
858
867
859
874
S001
875
868
852
not supplied
851
869
865
870
872
871
873

Note : 875 (FP-575 flexible board) is part that exchange the only leading part of 874 (FP-442 flexible board)

Ref. No.	Part No.	Description	Remark
851	3-945-734-01	ARM, HC DRIVING	
852	3-728-103-11	SCREW (M1.4X1.6), SPECIAL HEAD	
853	X-3941-259-1	ARM ASSY, PINCH PRESS	
854	3-726-829-01	WASHER, STOPPER	
855	3-945-730-01	SLEEVE, EJECT	
856	3-945-706-01	LEVER, EJECT	
857	3-945-729-01	SPRING, COMPRESSION	
858	X-3941-256-1	GEAR ASSY, CHANGE	
859	3-944-539-01	BELT, RELAY	
860	3-945-695-01	PULLEY, RELAY	
861	X-3941-260-1	SLIDER ASSY, M	
862	3-945-696-02	CAM	
863	X-3941-258-1	ARM ASSY, GL	
864	3-713-786-71	SCREW (M2X5)	
865	A-7040-303-A	CHASSIS ASSY, MECHANICAL	
866	3-947-503-01	SCREW (M1.4X2.5)	
867	3-945-722-01	RETAINER, GEAR	
868	X-3941-257-1	ARM ASSY, FF	
869	3-945-697-01	GEAR (B), L	
870	3-945-700-01	GEAR (A), L	
871	1-641-643-12	FP-444 FLEXIBLE BOARD	
872	1-691-254-13	CONNECTOR, TRANSLATION 10P	
873	3-945-756-01	SCREW (M1.4X3)	
874	1-641-639-13	FP-442 FLEXIBLE BOARD	
875	1-645-271-11	FP-575 FLEXIBLE BOARD	
S001	1-572-986-11	SWITCH, ROTARY (ENCODER)	
S005	1-570-771-21	SWITCH (C DOWN)	

AU-157

5-2. ELECTRICAL PARTS LIST

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- Hardware (# mark) list is given in the last of this parts list.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA..., uPA...: μPA...,
  uPB...: μPB..., uPC...: μPC...,
  uPD...: μPD...
- CAPACITORS
  uF : μF
- COILS
  uH : μH

Ref.No.	Part No.	Description				Remark
*	A-7063-943-A	AU-157 BOARD, COMPLETE **********************				
						(FX430/FX435/FX630) (Ref. No. 5,000 Series)
		< CAPACITOR >				
C402	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V	
C403	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	
C404	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	
C405	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V	
C407	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C408	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C409	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C411	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C412	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C413	1-126-209-11	ELECT	100uF	20%	4V	
C414	1-128-006-11	ELECT CHIP	4.7uF	20%	25V	
C415	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C416	1-162-951-11	CERAMIC CHIP	68PF	5%	50V	
C418	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	
C419	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V	
C421	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C422	1-164-674-11	CERAMIC CHIP	1800PF	5%	16V	
C423	1-164-471-11	CERAMIC CHIP	680PF	5%	50V	
C424	1-162-949-11	CERAMIC CHIP	47PF	5%	50V	
C425	1-164-346-11	CERAMIC CHIP	1uF		16V	
C426	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C427	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C428	1-128-006-11	ELECT CHIP	4.7uF	20%	25V	
C429	1-128-013-11	ELECT CHIP	1uF	20%	50V	
C430	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C431	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V	
C432	1-164-674-11	CERAMIC CHIP	1800PF	5%	16V	
C433	1-164-346-11	CERAMIC CHIP	1uF		16V	
C434	1-128-003-11	ELECT CHIP	22uF	20%	4V	
C435	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V	
C436	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C437	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C438	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	
C439	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C440	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C441	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C442	1-162-974-11	CERAMIC CHIP	0.01uF		50V	

Ref.No.	Part No.	Description				Remark
		< CONNECTOR >				
CN401	1-691-516-11	CONNECTOR, BOARD TO BOARD 24P				
CN402	1-691-487-21	CONNECTOR, FFC/FPC 8P				
		< DIODE >				
D402	8-719-045-87	DIODE MA4Z082WA				
		< IC >				
IC401	8-759-823-19	IC CXA1488RR				
		< COIL >				
L401	1-412-954-11	INDUCTOR 18uH				
		< TRANSISTOR >				
Q402	8-729-230-63	TRANSISTOR 2SC4116				
Q403	8-729-230-63	TRANSISTOR 2SC4116				
Q404	8-729-402-81	TRANSISTOR XN4501				
Q405	8-729-402-42	TRANSISTOR UN5213				
Q406	8-729-403-35	TRANSISTOR UN5113				
		< RESISTOR >				
R401	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R402	1-216-864-11	METAL CHIP	0	5%	1/16W	
R403	1-216-859-11	METAL GLAZE	1.5M	5%	1/16W	
R404	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R407	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R409	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R410	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R411	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R412	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R413	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R415	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R416	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R417	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R418	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R419	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R420	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R421	1-216-864-11	METAL CHIP	0	5%	1/16W	
R423	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R424	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R425	1-216-810-11	METAL CHIP	120	5%	1/16W	

Ref. No.	Part No.	Description	Remark
R427	1-216-817-11	METAL CHIP 470 5% 1/16W	
R428	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R429	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R430	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R431	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R432	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R433	1-216-817-11	METAL CHIP 470 5% 1/16W	
R434	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R435	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R436	1-216-837-11	METAL CHIP 22K 5% 1/16W	

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* A-7063-981-A AU-168 BOARD, COMPLETE (FX530)

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(Ref. No. 10,000 Series)

< CAPACITOR >

Ref. No.	Part No.	Description	Remark
C1302	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C1303	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V	
C1304	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V	
C1305	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V	
C1306	1-126-205-11	ELECT CHIP 47uF 20% 6.3V	
C1307	1-126-205-11	ELECT CHIP 47uF 20% 6.3V	
C1308	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V	
C1309	1-126-205-11	ELECT CHIP 47uF 20% 6.3V	
C1310	1-126-205-11	ELECT CHIP 47uF 20% 6.3V	
C1311	1-126-205-11	ELECT CHIP 47uF 20% 6.3V	
C1312	1-126-205-11	ELECT CHIP 47uF 20% 6.3V	
C1313	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C1314	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C1315	1-126-209-11	ELECT 100uF 20% 4V	
C1316	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C1318	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V	
C1319	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C1321	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V	
C1323	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V	
C1326	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V	
C1327	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V	
C1328	1-135-091-91	TANTAL. CHIP 1uF 20% 16V	
C1329	1-135-091-91	TANTAL. CHIP 1uF 20% 16V	
C1330	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C1331	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C1332	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V	
C1333	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V	
C1334	1-162-966-11	CERAMIC CHIP 0.0022uF 10% 50V	
C1335	1-162-966-11	CERAMIC CHIP 0.0022uF 10% 50V	
C1336	1-135-148-21	TANTAL. CHIP 1.5uF 20% 10V	
C1337	1-135-148-21	TANTAL. CHIP 1.5uF 20% 10V	
C1338	1-162-966-11	CERAMIC CHIP 0.0022uF 10% 50V	
C1339	1-162-966-11	CERAMIC CHIP 0.0022uF 10% 50V	
C1340	1-162-966-11	CERAMIC CHIP 0.0022uF 10% 50V	
C1341	1-162-966-11	CERAMIC CHIP 0.0022uF 10% 50V	
C1343	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V	
C1344	1-164-346-11	CERAMIC CHIP 1uF 16V	
C1345	1-162-967-11	CERAMIC CHIP 0.0033uF 10% 50V	
C1346	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C1347	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C1348	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V	
C1349	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C1350	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V	
C1352	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V	
C1353	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V	
C1355	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V	
C1356	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C1357	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C1358	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C1359	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C1360	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C1361	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C1362	1-162-969-11	CERAMIC CHIP 0.0068uF 10% 25V	
C1363	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C1364	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	

< CONNECTOR >

Ref. No.	Part No.	Description	Remark
CN1301	1-691-490-21	CONNECTOR, FFC/FPC 11P	
CN1301	1-691-491-21	CONNECTOR, FFC/FPC 12P	
CN1302	1-691-521-11	CONNECTOR, BOARD TO BOARD 40P	
* CN1302	1-691-933-11	CONNECTOR, BOARD TO BOARD 34P	

< DIODE >

Ref. No.	Part No.	Description	Remark
D1302	8-719-404-46	DIODE MA110	
D1303	8-719-045-87	DIODE MA4Z082WA	
D1304	8-719-045-87	DIODE MA4Z082WA	

< FILTER >

Ref. No.	Part No.	Description	Remark
FL402	1-236-838-21	FILTER, BAND PASS 1.7MHz	
FL1302	1-236-837-21	FILTER, BAND PASS 1.5MHz	

< IC >

Ref. No.	Part No.	Description	Remark
IC402	8-759-234-77	IC TC4S66F	
IC1301	8-759-159-94	IC LA7491W-TBM	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remark
Q1301	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q1302	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q1303	8-729-403-35	TRANSISTOR UN5113	
Q1305	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q1306	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q1311	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q1312	8-729-402-42	TRANSISTOR UN5213	
Q1313	8-729-403-35	TRANSISTOR UN5113	

Ref.No.	Part No.	Description				Remark
Q1315	8-729-402-42	TRANSISTOR	UN5213			
Q1316	8-729-230-63	TRANSISTOR	2SC4116-YG			
Q1317	8-729-230-63	TRANSISTOR	2SC4116-YG			
Q1318	8-729-402-81	TRANSISTOR	XN4501			
Q1319	8-729-402-81	TRANSISTOR	XN4501			
Q1320	8-729-230-63	TRANSISTOR	2SC4116-YG			
Q1321	8-729-420-12	TRANSISTOR	XN4213			
Q1322	8-729-420-12	TRANSISTOR	XN4213			

< RESISTOR >

Ref.No.	Part No.	Description				Remark
R1301	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R1302	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R1303	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R1304	1-216-810-11	METAL CHIP	120	5%	1/16W	
R1305	1-216-810-11	METAL CHIP	120	5%	1/16W	
R1306	1-216-817-11	METAL CHIP	470	5%	1/16W	
R1307	1-216-817-11	METAL CHIP	470	5%	1/16W	
R1308	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R1309	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R1312	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R1316	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R1317	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R1318	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R1321	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R1322	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R1323	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R1324	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R1325	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R1330	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R1331	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R1334	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R1335	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R1336	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R1337	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R1338	1-216-863-11	METAL GLAZE	3.3M	5%	1/16W	
R1340	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R1341	1-216-863-11	METAL GLAZE	3.3M	5%	1/16W	
R1342	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R1346	1-216-864-11	METAL CHIP	0	5%	1/16W	
R1347	1-216-864-11	METAL CHIP	0	5%	1/16W	
R1348	1-216-847-11	METAL CHIP	150K	5%	1/16W	
R1349	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R1350	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R1351	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R1352	1-216-864-11	METAL CHIP	0	5%	1/16W	
R1353	1-216-817-11	METAL CHIP	470	5%	1/16W	
R1354	1-216-817-11	METAL CHIP	470	5%	1/16W	
R1355	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R1356	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R1357	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R1358	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R1359	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R1360	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R1361	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R1362	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R1363	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R1364	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R1365	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R1366	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R1367	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R1368	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R1369	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R1370	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R1371	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R1372	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R1373	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R1375	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R1376	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R1378	1-216-817-11	METAL CHIP	470	5%	1/16W	
R1381	1-216-864-11	METAL CHIP	0	5%	1/16W	

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* A-7063-946-A DD-64 BOARD, COMPLETE(FX430/FX435/FX630)

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* A-7063-983-A DD-65 BOARD, COMPLETE (FX530)

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(Ref. No. 9,000 Series)

< CAPACITOR >

Ref.No.	Part No.	Description				Remark
C901	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V	
C902	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	
C903	1-163-121-00	CERAMIC CHIP	150PF	5%	50V	
C904	1-163-121-00	CERAMIC CHIP	150PF	5%	50V	
C906	1-164-245-11	CERAMIC CHIP	0.015uF	10%	25V	
C907	1-162-963-11	CERAMIC CHIP	680PF	10%	50V	
C908	1-162-963-11	CERAMIC CHIP	680PF	10%	50V	
C909	1-162-963-11	CERAMIC CHIP	680PF	10%	50V	
C910	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C911	1-162-963-11	CERAMIC CHIP	680PF	10%	50V	
C912	1-128-530-11	ELECT CHIP	33uF	20%	10V	
C913	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C914	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C915	1-165-178-11	CERAMIC CHIP	6.8uF		16V	
C916	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C917	1-165-178-11	CERAMIC CHIP	6.8uF		16V	
C918	1-165-178-11	CERAMIC CHIP	6.8uF		16V	
C920	1-165-178-11	CERAMIC CHIP	6.8uF		16V	
C921	1-165-178-11	CERAMIC CHIP	6.8uF		16V	
C923	1-165-178-11	CERAMIC CHIP	6.8uF		16V	
C924	1-165-178-11	CERAMIC CHIP	6.8uF		16V	

Ref. No.	Part No.	Description	Remark
C925	1-164-337-11	CERAMIC CHIP 2.2uF	16V
C926	1-164-337-11	CERAMIC CHIP 2.2uF	16V
C927	1-165-178-11	CERAMIC CHIP 6.8uF	16V
C928	1-165-178-11	CERAMIC CHIP 6.8uF	16V
C929	1-135-216-11	TANTALUM CHIP 10uF 20%	10V
C930	1-107-418-11	ELECT CHIP 10uF 20%	35V
C931	1-128-004-11	ELECT CHIP 10uF 20%	16V
C932	1-128-004-11	ELECT CHIP 10uF 20%	16V
C934	1-128-004-11	ELECT CHIP 10uF 20%	16V
C935	1-128-004-11	ELECT CHIP 10uF 20%	16V
C936	1-128-004-11	ELECT CHIP 10uF 20%	16V
C937	1-128-004-11	ELECT CHIP 10uF 20%	16V
C938	1-128-004-11	ELECT CHIP 10uF 20%	16V
C939	1-163-023-00	CERAMIC CHIP 0.015uF 5%	50V
C940	1-163-023-00	CERAMIC CHIP 0.015uF 5%	50V
C941	1-163-019-00	CERAMIC CHIP 0.0068uF 10%	50V
C942	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V
C943	1-163-019-00	CERAMIC CHIP 0.0068uF 10%	50V
C944	1-164-161-11	CERAMIC CHIP 0.0022uF 10%	100V
C945	1-128-530-11	ELECT CHIP 33uF 20%	10V
C950	1-128-004-11	ELECT CHIP 10uF 20%	16V
		< CONNECTOR >	
CN901	1-695-324-11	CONNECTOR, BOARD TO BOARD 42P	
		< DIODE >	
D900	8-719-045-87	DIODE MA4Z082WA	
D901	8-719-027-77	DIODE MA796	
D902	8-719-045-87	DIODE MA4Z082WA-TX (FX530)	
D909	8-719-404-49	DIODE MA111	
D910	8-719-404-49	DIODE MA111	
		< FUSE >	
⚠F450	1-576-213-11	FUSE, CHIP 1.6A 125V	
⚠F451	1-576-213-11	FUSE, CHIP 1.6A 125V	
⚠F452	1-576-213-11	FUSE, CHIP 1.6A 125V	
		< IC >	
IC901	8-759-249-14	IC MB3799-02PFV-GBND-ER	
		< JACK >	
J901	1-537-281-41	TERMINAL BOARD (BATTERY)	
J902	1-565-276-21	JACK, ULTRA SMALL 1P (REMOTE)	
J903	1-568-027-11	JACK, SMALL TYPE 1P (EARPHONE) (FX430/FX435/FX630)	
J903	1-569-809-11	JACK (SMALL TYPE)(PHONES)(FX530)	
		< COIL >	
L901	1-424-653-11	COIL, CHOKE 10uH	
L902	1-424-653-11	COIL, CHOKE 10uH	

Ref. No.	Part No.	Description	Remark
L903	1-424-653-11	COIL, CHOKE 10uH	
L904	1-409-556-11	COIL, CHOKE 47uH	
L905	1-424-674-11	COIL, CHOKE 22uH	
L906	1-409-556-11	COIL, CHOKE 47uH	
L907	1-424-674-11	COIL, CHOKE 22uH	
L908	1-424-674-11	COIL, CHOKE 22uH	
L909	1-412-056-11	INDUCTOR CHIP 4.7uH	
L910	1-412-056-11	INDUCTOR CHIP 4.7uH	
L911	1-412-056-11	INDUCTOR CHIP 4.7uH	
L912	1-412-056-11	INDUCTOR CHIP 4.7uH	
L913	1-412-056-11	INDUCTOR CHIP 4.7uH	
L914	1-412-064-11	INDUCTOR CHIP 100uH	
L915	1-412-064-11	INDUCTOR CHIP 100uH	
L916	1-412-056-11	INDUCTOR CHIP 4.7uH	
L917	1-412-056-11	INDUCTOR CHIP 4.7uH	
		< TRANSISTOR >	
Q901	8-729-420-12	TRANSISTOR XN4213	
Q902	8-729-804-41	TRANSISTOR 2SB1122	
Q903	8-729-823-82	TRANSISTOR FP101	
Q904	8-729-823-84	TRANSISTOR FP102	
Q905	8-729-823-82	TRANSISTOR FP101	
Q906	8-729-823-82	TRANSISTOR FP101	
Q907	8-729-823-82	TRANSISTOR FP101	
Q909	8-729-805-25	TRANSISTOR 2SB1121	
Q911	8-729-402-42	TRANSISTOR UN5213	
Q912	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q914	8-729-402-42	TRANSISTOR UN5213	
Q915	8-729-402-42	TRANSISTOR UN5213	
		< RESISTOR >	
R901	1-218-717-11	METAL CHIP 11K 0.50%	1/16W
R902	1-216-833-11	METAL CHIP 10K 5%	1/16W
R903	1-216-827-11	METAL CHIP 3.3K 5%	1/16W
R904	1-216-827-11	METAL CHIP 3.3K 5%	1/16W
R905	1-216-836-11	METAL CHIP 18K 5%	1/16W
R906	1-216-827-11	METAL CHIP 3.3K 5%	1/16W
R907	1-216-035-00	METAL CHIP 270 5%	1/10W
R908	1-216-834-11	METAL CHIP 12K 5%	1/16W
R909	1-216-031-00	METAL CHIP 180 5%	1/10W
R910	1-216-029-00	METAL CHIP 150 5%	1/10W
R911	1-216-029-00	METAL CHIP 150 5%	1/10W
R912	1-216-029-00	METAL CHIP 150 5%	1/10W
R913	1-216-041-00	METAL CHIP 470 5%	1/10W
R915	1-216-864-11	METAL CHIP 0 5%	1/16W
R918	1-216-819-11	METAL CHIP 680 5%	1/16W
R919	1-216-836-11	METAL CHIP 18K 5%	1/16W
R920	1-216-841-11	METAL CHIP 47K 5%	1/16W
R921	1-216-296-91	METAL GLAZE 0 5%	1/8W
R922	1-216-833-11	METAL CHIP 10K 5%	1/16W

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

Ref.No.	Part No.	Description	Remark
R923	1-216-296-91	METAL GLAZE 0 5% 1/8W	
R924	1-216-864-11	METAL CHIP 0 5% 1/16W	
R925	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R926	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R931	1-216-864-11	METAL CHIP 0 5% 1/16W	
R932	1-216-864-11	METAL CHIP 0 5% 1/16W	
R933	1-216-864-11	METAL CHIP 0 5% 1/16W	(FX530)
R934	1-216-864-11	METAL CHIP 0 5% 1/16W	
R936	1-216-864-11	METAL CHIP 0 5% 1/16W	
R937	1-216-864-11	METAL CHIP 0 5% 1/16W	
R938	1-216-864-11	METAL CHIP 0 5% 1/16W	
R940	1-216-864-11	METAL CHIP 0 5% 1/16W	
R941	1-218-849-11	METAL CHIP 1.2K 0.50% 1/16W	
R942	1-216-864-11	METAL CHIP 0 5% 1/16W	
R944	1-216-864-11	METAL CHIP 0 5% 1/16W	
R945	1-218-847-11	METAL CHIP 1K 0.50% 1/16W	

< TRANSFORMER >

T901	1-426-730-11	TRANSFORMER, CONVERTER	

****

* A-7071-996-A FP-46 (CD) BOARD, COMPLETE (FX630)
****

* A-7072-003-A FP-46 (CD) BOARD, COMPLETE
****
(FX430/FX435/FX530)
(Ref. No. 3,000 Series)

< CAPACITOR >

C691	1-135-214-21	TANTAL. CHIP 4.7uF 20% 20V	
C692	1-135-210-11	TANTALUM CHIP 4.7uF 20% 10V	
C694	1-164-346-11	CERAMIC CHIP 1uF 16V	
C695	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C696	1-104-908-11	TANTAL. CHIP 47uF 20% 4V	

< COIL >

L691	1-412-963-11	INDUCTOR 100uH	

< TRANSISTOR >

Q691	8-729-232-86	TRANSISTOR 2SK1875-BL/V	
Q692	8-729-117-73	TRANSISTOR 2SC4178	

< RESISTOR >

R691	1-216-295-00	METAL CHIP 0 5% 1/10W	
R692	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R693	1-216-839-11	METAL CHIP 33K 5% 1/16W	(FX430/FX435/FX530)
R693	1-216-840-11	METAL CHIP 39K 5% 1/16W	(FX630)
R694	1-216-819-11	METAL CHIP 680 5% 1/16W	(FX430/FX435/FX530)
R694	1-216-820-11	METAL CHIP 820 5% 1/16W	(FX630)
R695	1-216-845-11	METAL CHIP 100K 5% 1/16W	(FX630)
R695	1-216-849-11	METAL CHIP 220K 5% 1/16W	(FX430/FX435/FX530)
R696	1-216-809-11	METAL CHIP 100 5% 1/16W	
R697	1-216-833-11	METAL CHIP 10K 5% 1/16W	

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* 1-651-890-11 FP-49 FLEXIBLE BOARD (FX630)
****
(Ref. No. 3,000 Series)

< SENSOR >

SE691	1-810-024-31	SENSOR, ANGULAR VELOCITY	(FX630)
SE692	1-810-024-41	SENSOR, ANGULAR VELOCITY	(FX630)

****

* 1-641-639-13 FP-442 FLEXIBLE BOARD
****

< SWITCH >

S001	1-570-771-21	SWITCH	
S005	1-572-986-11	SWTICH, ROTARY (ENCODER)	

****

LM-40 BOARD, COMPLETE
****

CN512	1-568-323-11	CONNECTOR, BOARD TO BOARD 4P	

****

LS-33 BOARD, COMPLETE
****

< DIODE >

D001	8-719-989-52	DIODE GL4600S	

< HALL ELEMENT >

H001	8-719-987-62	DIODE LT140SAZ	
H002	8-719-987-62	DIODE LT140SAZ	

< TRANSISTOR >

Q001	8-729-012-46	TRANSISTOR PT4600FS	
Q002	8-729-012-46	TRANSISTOR PT4600FS	

< RESISTOR >

R003	1-216-033-00	METAL CHIP 220 5% 1/10W	
R004	1-216-033-00	METAL CHIP 220 5% 1/10W	
R010	1-216-033-00	METAL CHIP 220 5% 1/10W	
R011	1-216-033-00	METAL CHIP 220 5% 1/10W	

Ref. No.	Part No.	Description	Remark
		< SWITCH >	
S002	1-572-987-11	SWITCH, PUSH (3 KEY)	
**			
*	A-7063-941-A	MA-197 BOARD, COMPLETE ********************** (FX430/FX435/FX630) (Ref. No. 6,000 Series)	
		< CAPACITOR >	
C014	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C015	1-162-966-11	CERAMIC CHIP 0.0022uF 10% 50V	
C032	1-164-346-11	CERAMIC CHIP 1uF 16V	
C033	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C034	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C035	1-162-587-11	CERAMIC CHIP 0.039uF 10% 25V	
C036	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V	
C037	1-164-346-11	CERAMIC CHIP 1uF 16V	
C040	1-126-205-11	ELECT CHIP 47uF 20% 6.3V	
C041	1-164-489-11	CERAMIC CHIP 0.22uF 10% 16V	
C043	1-128-004-11	ELECT CHIP 10uF 20% 16V	
		< CONNECTOR >	
CN001	1-764-517-11	CONNECTOR, FFC/FPC (ZIF) 7P	
CN003	1-580-057-11	PIN, CONNECTOR 4P	
		< DIODE >	
D001	8-719-404-49	DIODE MA111	
D002	8-719-404-49	DIODE MA111	
		< IC >	
IC002	8-749-923-29	IC RS-20E-T	
IC003	8-759-822-37	IC LA7293M-TE-L	
		< JACK >	
J001	1-568-027-11	JACK, SMALL TYPE 1P (EXT MIC)	
		< COIL >	
L002	1-412-939-11	INDUCTOR 1uH	
L003	1-412-939-11	INDUCTOR 1uH	
		< TRANSISTOR >	
Q002	8-729-402-63	TRANSISTOR 2SB1218A-Q-TX	
		< RESISTOR >	
R027	1-216-864-11	METAL CHIP 0 5% 1/16W	
R028	1-216-818-11	METAL CHIP 560 5% 1/16W	
R029	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	

Ref. No.	Part No.	Description	Remark
R030	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R031	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R032	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R033	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R044	1-216-853-11	METAL CHIP 470K 5% 1/16W	
**			
*	A-7063-980-A	MA-198 BOARD, COMPLETE (FX530) ****************************** (Ref. No. 7,000 Series)	
		< CAPACITOR >	
C001	1-164-343-11	CERAMIC CHIP 0.056uF 10% 25V	
C003	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C005	1-163-023-00	CERAMIC CHIP 0.015uF 5% 50V	
C006	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C007	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C008	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C009	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V	
C010	1-135-091-91	TANTAL. CHIP 1uF 20% 16V	
C011	1-163-986-00	CERAMIC CHIP 0.027uF 10% 25V	
C012	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C013	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C019	1-163-986-00	CERAMIC CHIP 0.027uF 10% 25V	
C020	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C021	1-126-205-11	ELECT CHIP 47uF 20% 6.3V	
C022	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V	
C023	1-135-091-91	TANTAL. CHIP 1uF 20% 16V	
C024	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C025	1-163-023-00	CERAMIC CHIP 0.015uF 5% 50V	
C026	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C027	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C030	1-164-343-11	CERAMIC CHIP 0.056uF 10% 25V	
		< CONNECTOR >	
CN001	1-764-519-21	CONNECTOR, FFC/FPC (ZIF) 10P	
* CN002	1-580-055-21	PIN, CONNECTOR 2P	
* CN003	1-580-055-21	PIN, CONNECTOR 2P	
		< DIODE >	
D001	8-719-404-46	DIODE MA110	
D002	8-719-404-46	DIODE MA110	
		< IC >	
IC001	8-759-084-53	IC CXA1618AN-E2	
		< JACK >	
J001	1-691-737-11	JACK (SMALL TYPE) (EXT MIC)	

Ref.No.	Part No.	Description	Remark
		< COIL >	
L001	1-412-939-11	INDUCTOR 1uH	
		< TRANSISTOR >	
Q001	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q003	8-729-402-42	TRANSISTOR UN5213	
		< RESISTOR >	
R003	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R004	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R005	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R006	1-216-864-11	METAL CHIP 0 5% 1/16W	
R007	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R008	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R009	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R010	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R011	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R012	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R013	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R014	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R015	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R016	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R017	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R018	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R019	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R020	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R022	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R023	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R024	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R025	1-216-864-11	METAL CHIP 0 5% 1/16W	
R036	1-216-864-11	METAL CHIP 0 5% 1/16W	
R037	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R039	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	

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* A-7072-000-A SL-38 BOARD, COMPLETE

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(Ref. No. 4,000 Series)

Ref.No.	Part No.	Description	Remark
		< CAPACITOR >	
C543	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C544	1-135-211-11	TANTAL. CHIP 6.8uF 20% 6.3V	
C545	1-135-211-11	TANTAL. CHIP 6.8uF 20% 6.3V	
C546	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C547	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C551	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C553	1-164-361-11	CERAMIC CHIP 0.047uF 16V	
C554	1-135-215-21	TANTAL. CHIP 6.8uF 20% 16V	
C555	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C556	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C557	1-135-149-21	TANTALUM CHIP 2.2uF 20% 10V	
C558	1-164-489-11	CERAMIC CHIP 0.22uF 10% 16V	
		< CONNECTOR >	
CN500	1-691-473-21	CONNECTOR, FFC/FPC 7P	
CN501	1-691-472-21	CONNECTOR, FFC/FPC 6P	
CN502	1-691-482-21	CONNECTOR, FFC/FPC 15P	
		< IC >	
IC507	8-759-165-47	IC MPC1780VFUEB	
		< COIL >	
L505	1-414-078-11	INDUCTOR 10uH	
		< TRANSISTOR >	
Q560	8-729-805-25	TRANSISTOR 2SB1121	
Q561	8-729-425-50	TRANSISTOR 2SB1462Q	
Q562	8-729-402-81	TRANSISTOR XN4501	
		< RESISTOR >	
R562	1-218-879-11	METAL CHIP 22K 0.50% 1/16W	
R563	1-218-879-11	METAL CHIP 22K 0.50% 1/16W	
R564	1-216-864-11	METAL CHIP 0 5% 1/16W	
R565	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R566	1-218-857-11	METAL CHIP 2.7K 0.50% 1/16W	
R567	1-216-295-00	METAL CHIP 0 5% 1/10W	
R568	1-216-168-00	METAL GLAZE 56 5% 1/8W	
R569	1-218-879-11	METAL CHIP 22K 0.50% 1/16W	
R570	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R571	1-218-879-11	METAL CHIP 22K 0.50% 1/16W	
R572	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R590	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R591	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
		< FLEXIBLE BOARD >	
W500	1-651-889-11	FP-48 FLEXIBLE BOARD 36P	
W501	1-642-186-11	FP-437 FLEXIBLE BOARD 4P	

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Ref. No.	Part No.	Description			Remark
*	A-7063-984-A	VC-142 BOARD, COMPLETE (FX530) ******************************			
*	A-7063-945-A	VC-143 BOARD, COMPLETE (FX630) ******************************			
*	A-7063-949-A	VC-143 BOARD, COMPLETE (FX430/FX435) ************************************			
		(Ref. No. 1,000 Series)			
		< CAPACITOR >			
C604	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C605	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C606	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C607	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C608	1-104-847-11	TANTAL. CHIP	22uF	20%	4V
C609	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C610	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C611	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C613	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C614	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C616	1-135-091-91	TANTAL. CHIP	1uF	20%	16V
C617	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C618	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C619	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C620	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C621	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C622	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C623	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C624	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C627	1-162-946-11	CERAMIC CHIP	27PF	5%	50V
C628	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C629	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C630	1-162-946-11	CERAMIC CHIP	27PF	5%	50V
C631	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C632	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C633	1-162-946-11	CERAMIC CHIP	27PF	5%	50V (FX630)
C633	1-162-947-11	CERAMIC CHIP	33PF	5%	50V (FX430/FX435/FX530)
C634	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C635	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V (FX630)
C636	1-164-360-11	CERAMIC CHIP	0.1uF		16V (FX630)
C637	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C638	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C639	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C699	1-162-954-11	CERAMIC CHIP	120PF	5%	50V (FX630)
C701	1-163-059-91	CERAMIC CHIP	0.01uF	10%	50V
C702	1-162-638-11	CERAMIC CHIP	1uF		16V
C703	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C704	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C705	1-135-145-11	TANTALUM CHIP	0.47uF	10%	35V
C706	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C708	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C709	1-135-214-21	TANTAL. CHIP	4.7uF	20%	20V
C710	1-162-971-11	CERAMIC CHIP	0.001uF		50V
C711	1-162-971-11	CERAMIC CHIP	0.001uF		50V
C712	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C713	1-107-685-11	TANTAL. CHIP	15uF	20%	6.3V
C714	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C715	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C716	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C717	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C718	1-162-637-11	CERAMIC CHIP	0.47uF		16V
C719	1-162-971-11	CERAMIC CHIP	0.001uF		50V
C720	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C721	1-162-916-11	CERAMIC CHIP	12PF	5%	50V
C722	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C724	1-162-949-11	CERAMIC CHIP	47PF	5%	50V (FX530/FX630)
C725	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C726	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C727	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C728	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C729	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C730	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V (FX630)
C730	1-164-298-11	CERAMIC CHIP	0.15uF	10%	25V (FX430/FX435/FX530)
C731	1-135-091-91	TANTAL. CHIP	1uF	20%	16V
C732	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C733	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C734	1-135-091-91	TANTAL. CHIP	1uF	20%	16V
C735	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C737	1-162-946-11	CERAMIC CHIP	27PF	5%	50V
C739	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C741	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C742	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C743	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C744	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C745	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C746	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C747	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C748	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C749	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C750	1-162-971-11	CERAMIC CHIP	0.001uF		50V
C751	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C752	1-162-971-11	CERAMIC CHIP	0.001uF		50V
C753	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C754	1-162-974-11	CERAMIC CHIP	0.01uF		50V

Ref. No.	Part No.	Description	Remark
C755	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C756	1-104-752-11	TANTAL. CHIP 33uF 20%	6.3V
C757	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C771	1-164-245-11	CERAMIC CHIP 0.015uF 10%	25V (FX630)
C772	1-164-004-11	CERAMIC CHIP 0.1uF 10%	25V (FX630)
C773	1-164-299-11	CERAMIC CHIP 0.22uF 10%	25V (FX630)
C774	1-128-257-21	ELECT CHIP 33uF 20%	10V (FX630)
C775	1-128-257-21	ELECT CHIP 33uF 20%	10V (FX630)
C776	1-162-953-11	CERAMIC CHIP 100PF 5%	50V (FX630)
C777	1-162-568-11	CERAMIC CHIP 0.33uF 10%	16V (FX630)
C778	1-162-953-11	CERAMIC CHIP 100PF 5%	50V (FX630)
C779	1-162-568-11	CERAMIC CHIP 0.33uF 10%	16V (FX630)
C780	1-164-360-11	CERAMIC CHIP 0.1uF	16V (FX630)
C781	1-162-974-11	CERAMIC CHIP 0.01uF	50V (FX630)
C782	1-135-259-11	TANTAL. CHIP 10uF 20%	6.3V (FX630)
C783	1-135-259-11	TANTAL. CHIP 10uF 20%	6.3V (FX630)
C784	1-162-974-11	CERAMIC CHIP 0.01uF	50V (FX630)
C785	1-162-974-11	CERAMIC CHIP 0.01uF	50V (FX630)
C786	1-135-259-11	TANTAL. CHIP 10uF 20%	6.3V (FX630)
C788	1-164-004-11	CERAMIC CHIP 0.1uF 10%	25V (FX630)
C789	1-164-245-11	CERAMIC CHIP 0.015uF 10%	25V (FX630)
C790	1-164-299-11	CERAMIC CHIP 0.22uF 10%	25V (FX630)
C793	1-135-259-11	TANTAL. CHIP 10uF 20%	6.3V (FX630)
C794	1-164-360-11	CERAMIC CHIP 0.1uF	16V (FX630)

< CONNECTOR >

Ref. No.	Part No.	Description	Remark
* CN601	1-764-395-21	CONNECTOR, BOARD TO BOARD 42P	
* CN701	1-573-925-11	CONNECTOR, FFC/FPC (ZIF) 16P	
CN751	1-573-361-11	CONNECTOR, FFC/FPC 21P	
CN775	1-691-487-21	CONNECTOR, FFC/FPC 8P (FX630)	

< TRIMMER >

Ref. No.	Part No.	Description	Remark
CT701	1-141-430-51	CAP, CHIP TRIMMER	

< DIODE >

Ref. No.	Part No.	Description	Remark
D701	8-719-016-74	DIODE 1SS352	
D701	8-719-404-46	DIODE MA110	
D701	8-719-404-49	DIODE MA111	
D702	8-719-016-74	DIODE 1SS352	
D702	8-719-404-46	DIODE MA110	
D702	8-719-404-49	DIODE MA111	
D703	8-719-016-74	DIODE 1SS352	
D703	8-719-404-46	DIODE MA110	
D703	8-719-404-49	DIODE MA111	
D705	8-719-016-74	DIODE 1SS352	
D705	8-719-404-46	DIODE MA110	
D705	8-719-404-49	DIODE MA111	

< FILTER >

Ref. No.	Part No.	Description	Remark
FL601	1-239-352-11	FILTER, LOW PASS (FX630)	
FL601	1-239-766-11	FILTER, LOW PASS (FX430/FX435/FX530)	

< IC >

Ref. No.	Part No.	Description	Remark
IC601	8-759-044-78	IC AK6420F-SGX2060	
IC602	8-759-260-67	IC SC424608MC68HC11MA8FU	
IC603	8-759-064-36	IC MB88346BPFV	
IC604	8-759-710-29	IC NJM2235M	
IC609	8-752-365-71	IC CXD2150R-T6	
IC610	8-752-365-72	IC CXD2151R-T6	
IC611	8-759-262-36	IC CXD2133BR-T6	
IC613	8-759-247-06	IC CXD2152REL (FX630)	
IC614	8-759-255-09	IC uPD6461GS-802-GLG-E2	
IC701	8-752-355-07	IC CXD1267N	
IC702	8-752-365-73	IC CXD2405R (FX630)	
IC702	8-752-365-74	IC CXD1266R-T4 (FX430/FX435/FX530)	
IC703	8-752-069-21	IC CXA1690Q	
IC704	8-759-173-24	IC AD875JST-REEL (FX430/FX435/FX530)	
IC704	8-759-263-29	IC HD49315FEB (FX630)	
IC705	8-752-365-76	IC CXD2407R	
IC751	8-759-701-24	IC NJM3414M	
IC752	8-759-058-52	IC XRA10324AF	
IC752	8-759-060-02	IC BA10324AF	
IC752	8-759-100-95	IC uPC324G2	
IC753	8-752-365-65	IC CXD2126N	
IC754	8-759-247-07	IC MPC17A34VMEL	
IC755	8-759-031-58	IC SC7SU04F	
IC772	8-759-234-77	IC TC4S66F (FX630)	
IC773	8-759-234-77	IC TC4S66F (FX630)	
IC774	8-759-058-45	IC NJM3403AV (TE2)(FX630)	
IC775	8-759-080-34	IC TA75W01FU-TE12R (FX630)	

Ref. No.	Part No.	Description	Remark
IC776	8-759-248-78	IC MB88102PFV-G-BND-ER	(FX630)
IC777	8-752-850-54	IC CXP87132-010R	(FX630)

< COIL >

Ref. No.	Part No.	Description	Remark
L601	1-412-058-11	INDUCTOR CHIP 10uH	
L602	1-414-078-11	INDUCTOR 10uH	
L603	1-412-058-11	INDUCTOR CHIP 10uH	
L604	1-414-078-11	INDUCTOR 10uH	
L605	1-410-391-11	INDUCTOR CHIP 68uH	
L606	1-414-078-11	INDUCTOR 10uH	
L607	1-414-078-11	INDUCTOR 10uH	(FX630)
L608	1-412-006-31	INDUCTOR CHIP 10uH	
L609	1-412-979-21	INDUCTOR 1uH	
L610	1-412-979-21	INDUCTOR 1uH	
L611	1-412-052-21	INDUCTOR CHIP 1uH	
L612	1-412-052-21	INDUCTOR CHIP 1uH	
L614	1-412-052-21	INDUCTOR CHIP 1uH	
L702	1-412-058-11	INDUCTOR CHIP 10uH	
L703	1-412-058-11	INDUCTOR CHIP 10uH	
L704	1-412-058-11	INDUCTOR CHIP 10uH	
L705	1-412-058-11	INDUCTOR CHIP 10uH	
L706	1-412-058-11	INDUCTOR CHIP 10uH	
L751	1-412-062-11	INDUCTOR CHIP 47uH	
L752	1-412-058-11	INDUCTOR CHIP 10uH	
L753	1-412-058-11	INDUCTOR CHIP 10uH	
L775	1-412-058-11	INDUCTOR CHIP 10uH	(FX630)
L777	1-414-078-11	INDUCTOR 10uH	(FX630)
L778	1-414-078-11	INDUCTOR 10uH	(FX630)

< TRANSISTOR >

Ref. No.	Part No.	Description	Remark
Q604	8-729-010-60	TRANSISTOR MSA1586-BC	
Q604	8-729-230-60	TRANSISTOR 2SA1586-YG	
Q604	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q605	8-729-010-60	TRANSISTOR MSA1586-BC	
Q605	8-729-230-60	TRANSISTOR 2SA1586-YG	
Q605	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q606	8-729-010-75	TRANSISTOR MSC4116-BC	
Q606	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q606	8-729-602-21	TRANSISTOR 2SC4154	
Q607	8-729-010-75	TRANSISTOR MSC4116-BC	
Q607	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q607	8-729-602-21	TRANSISTOR 2SC4154	
Q701	8-729-403-27	TRANSISTOR XN4401	
Q751	8-729-010-75	TRANSISTOR MSC4116-BC	
Q751	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q751	8-729-602-21	TRANSISTOR 2SC4154	
Q752	8-729-013-88	TRANSISTOR RN1302	
Q752	8-729-015-76	TRANSISTOR UN5211-TX	

< RESISTOR >

Ref. No.	Part No.	Description	Remark
R601	1-216-851-11	METAL CHIP 330K 5% 1/16W	
R602	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R603	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R604	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R605	1-216-864-11	METAL CHIP 0 5% 1/16W	
R606	1-216-847-11	METAL CHIP 150K 5% 1/16W	
R607	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R608	1-216-864-11	METAL CHIP 0 5% 1/16W	
R609	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R610	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R611	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R612	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R613	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R616	1-216-864-11	METAL CHIP 0 5% 1/16W	(FX630)
R619	1-216-803-11	METAL CHIP 33 5% 1/16W	
R620	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R621	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R624	1-216-864-11	METAL CHIP 0 5% 1/16W	(FX430/FX435/FX530)
R626	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R627	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R629	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R630	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R631	1-216-864-11	METAL CHIP 0 5% 1/16W	
R634	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R635	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R636	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R637	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R638	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R639	1-216-864-11	METAL CHIP 0 5% 1/16W	
R640	1-216-815-11	METAL CHIP 330 5% 1/16W	
R641	1-216-296-91	METAL GLAZE 0 5% 1/8W	
R643	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R645	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R646	1-216-818-11	METAL CHIP 560 5% 1/16W	
R647	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R648	1-216-818-11	METAL CHIP 560 5% 1/16W	
R649	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R650	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R651	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R652	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R653	1-216-864-11	METAL CHIP 0 5% 1/16W	
R656	1-216-864-11	METAL CHIP 0 5% 1/16W	(FX430/FX435/FX530)
R657	1-216-864-11	METAL CHIP 0 5% 1/16W	(FX630)
R658	1-216-864-11	METAL CHIP 0 5% 1/16W	
R659	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R661	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R662	1-216-821-11	METAL CHIP 1K 5% 1/16W	

Ref.No.	Part No.	Description	Remark
R663	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R664	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R665	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R666	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R667	1-216-820-11	METAL CHIP 820 5% 1/16W	
R668	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	
R669	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R670	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R701	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R702	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R703	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R704	1-216-840-11	METAL CHIP 39K 5% 1/16W	(FX630)
R705	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R709	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R710	1-216-864-11	METAL CHIP 0 5% 1/16W	(FX430/FX435/FX530)
R711	1-216-864-11	METAL CHIP 0 5% 1/16W	(FX630)
R712	1-216-864-11	METAL CHIP 0 5% 1/16W	(FX430/FX435/FX530)
R713	1-216-807-11	METAL CHIP 68 5% 1/16W	
R714	1-216-864-11	METAL CHIP 0 5% 1/16W	
R715	1-216-864-11	METAL CHIP 0 5% 1/16W	(FX630)
R716	1-218-847-11	METAL CHIP 1K 0.50% 1/16W	
R717	1-216-864-11	METAL CHIP 0 5% 1/16W	(FX630)
R718	1-216-807-11	METAL CHIP 68 5% 1/16W	
R719	1-218-876-11	METAL CHIP 16K 0.50% 1/16W	
R720	1-216-843-11	METAL CHIP 68K 5% 1/16W	(FX630)
R721	1-216-864-11	METAL CHIP 0 5% 1/16W	(FX630)
R722	1-216-864-11	METAL CHIP 0 5% 1/16W	(FX630)
R723	1-216-864-11	METAL CHIP 0 5% 1/16W	(FX430/FX435/FX530)
R724	1-216-864-11	METAL CHIP 0 5% 1/16W	(FX630)
R725	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R740	1-216-864-11	METAL CHIP 0 5% 1/16W	
R741	1-218-855-11	METAL CHIP 2.2K 0.50% 1/16W	
R742	1-218-865-11	METAL CHIP 5.6K 0.50% 1/16W	
R743	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R744	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R745	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R746	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R747	1-216-820-11	METAL CHIP 820 5% 1/16W	
R748	1-216-828-11	METAL CHIP 3.9K 5% 1/16W	
R749	1-216-851-11	METAL CHIP 330K 5% 1/16W	
R750	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R751	1-216-809-11	METAL CHIP 100 5% 1/16W	
R752	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R753	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R754	1-216-848-11	METAL CHIP 180K 5% 1/16W	
R755	1-216-855-11	METAL CHIP 680K 5% 1/16W	
R756	1-216-848-11	METAL CHIP 180K 5% 1/16W	
R757	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R758	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R759	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R760	1-216-826-11	METAL CHIP 2.7K 5% 1/16W	
R761	1-216-842-11	METAL CHIP 56K 5% 1/16W	
R762	1-216-842-11	METAL CHIP 56K 5% 1/16W	
R764	1-216-828-11	METAL CHIP 3.9K 5% 1/16W	
R765	1-216-833-11	METAL CHIP 10K 5% 1/16W	(FX630)
R766	1-216-835-11	METAL CHIP 15K 5% 1/16W	(FX630)
R767	1-216-850-11	METAL CHIP 270K 5% 1/16W	(FX630)
R768	1-216-833-11	METAL CHIP 10K 5% 1/16W	(FX630)
R769	1-216-850-11	METAL CHIP 270K 5% 1/16W	(FX630)
R770	1-216-835-11	METAL CHIP 15K 5% 1/16W	(FX630)
R771	1-216-803-11	METAL CHIP 33 5% 1/16W	(FX630)
R772	1-216-837-11	METAL CHIP 22K 5% 1/16W	(FX630)
R773	1-216-837-11	METAL CHIP 22K 5% 1/16W	(FX630)
R774	1-216-837-11	METAL CHIP 22K 5% 1/16W	(FX630)
R775	1-216-837-11	METAL CHIP 22K 5% 1/16W	(FX630)
R776	1-216-837-11	METAL CHIP 22K 5% 1/16W	(FX630)
R777	1-216-837-11	METAL CHIP 22K 5% 1/16W	(FX630)
R778	1-216-833-11	METAL CHIP 10K 5% 1/16W	(FX630)
R779	1-218-911-11	METAL CHIP 470K 0.50% 1/16W	(FX630)
R780	1-218-911-11	METAL CHIP 470K 0.50% 1/16W	(FX630)
R781	1-216-833-11	METAL CHIP 10K 5% 1/16W	(FX630)
R782	1-218-911-11	METAL CHIP 470K 0.50% 1/16W	(FX630)
R783	1-218-911-11	METAL CHIP 470K 0.50% 1/16W	(FX630)
R786	1-216-841-11	METAL CHIP 47K 5% 1/16W	(FX630)
R787	1-216-841-11	METAL CHIP 47K 5% 1/16W	(FX630)
R788	1-216-841-11	METAL CHIP 47K 5% 1/16W	(FX630)
R789	1-216-841-11	METAL CHIP 47K 5% 1/16W	(FX630)
R790	1-216-833-11	METAL CHIP 10K 5% 1/16W	(FX630)
R791	1-216-864-11	METAL CHIP 0 5% 1/16W	(FX630)
R792	1-216-857-11	METAL CHIP 1M 5% 1/16W	(FX630)
R793	1-216-841-11	METAL CHIP 47K 5% 1/16W	(FX630)
R2004	1-216-864-11	METAL CHIP 0 5% 1/16W	(FX430/FX435/FX530)

< VIBRATOR >

X601	1-760-081-21	VIBRATOR, CERAMIC (24MHz)
X701	1-760-320-11	VIBRATOR, CRYSTAL (28.5363MHz)
X775	1-579-553-11	VIBRATOR (12MHz)(FX630)

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* A-7063-947-A VF-44 BOARD, COMPLETE
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(Ref. No. 8,000 Series)

< CAPACITOR >

C501	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C502	1-126-176-11	ELECT	220uF	20%	10V
C503	1-163-077-91	CERAMIC CHIP	0.1uF		50V
C504	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V

Ref.No.	Part No.	Description	Remark
⚠C505	1-162-625-11	CERAMIC CHIP 0.0047uF 5%	50V
⚠C506	1-164-758-11	CERAMIC CHIP 0.0039uF 5%	50V
C508	1-127-515-11	ELECT(SOLID) 47uF 20%	6.3V
C509	1-126-090-11	ELECT 82uF 20%	10V
C510	1-164-611-11	CERAMIC CHIP 0.001uF 10%	500V
C511	1-124-257-00	ELECT 2.2uF 20%	50V
C512	1-163-037-11	CERAMIC CHIP 0.022uF 10%	25V
C513	1-137-306-11	FILM CHIP 0.1uF 5%	16V
C514	1-162-638-11	CERAMIC CHIP 1uF	16V
C515	1-131-381-00	TANTALUM 47uF 10%	10V
C516	1-163-011-11	CERAMIC CHIP 0.0015uF 10%	50V
C517	1-135-091-91	TANTAL. CHIP 1uF 20%	16V

< CONNECTOR >

Ref.No.	Part No.	Description	Remark
* CN502	1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	
* CN503	1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	

< DIODE >

Ref.No.	Part No.	Description	Remark
D501	8-719-024-87	DIODE LN1261CAL	
D502	8-719-024-87	DIODE LN1261CAL	
D503	8-719-400-20	DIODE MA152WA	

< IC >

Ref.No.	Part No.	Description	Remark
IC501	8-759-196-14	IC BA7149F-E2	

< COIL >

Ref.No.	Part No.	Description	Remark
L501	1-412-031-11	INDUCTOR CHIP 47uH	
L502	1-410-385-11	INDUCTOR CHIP 22uH	
⚠L503	1-459-876-41	COIL, FERRITE (HLC)	

< TRANSISTOR >

Ref.No.	Part No.	Description	Remark
Q501	8-729-216-31	TRANSISTOR 2SA1163-G	
Q502	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q503	8-729-106-68	TRANSISTOR 2SD1615A-GP	

< RESISTOR >

Ref.No.	Part No.	Description	Remark
R501	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R502	1-216-059-00	METAL CHIP 2.7K 5% 1/10W	
R503	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R504	1-216-041-00	METAL CHIP 470 5% 1/10W	
R505	1-216-041-00	METAL CHIP 470 5% 1/10W	
R506	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R507	1-216-051-00	METAL CHIP 1.2K 5% 1/10W	
R508	1-216-005-00	METAL CHIP 15 5% 1/10W	
R509	1-216-870-11	METAL CHIP 180K 1% 1/10W	
R510	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R511	1-216-129-00	METAL CHIP 2.2M 5% 1/10W	
R512	1-216-133-00	METAL CHIP 3.3M 5% 1/10W	
R513	1-216-125-00	METAL CHIP 1.5M 5% 1/10W	
R514	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R515	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R516	1-216-025-00	METAL CHIP 100 5% 1/10W	
R517	1-216-308-00	METAL CHIP 4.7 5% 1/10W	
R518	1-216-683-11	METAL CHIP 22K 0.5% 1/10W	
R519	1-216-693-11	METAL CHIP 56K 0.5% 1/10W	
R520	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R521	1-216-160-00	METAL GLAZE 27 5% 1/8W	
R522	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R523	1-216-111-00	METAL CHIP 390K 5% 1/10W	
R524	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R525	1-216-031-00	METAL CHIP 180 5% 1/10W	
R526	1-216-689-11	METAL CHIP 39K 0.5% 1/10W	
R528	1-216-077-00	METAL CHIP 15K 5% 1/10W	

< VARIABLE RESISTOR >

Ref.No.	Part No.	Description	Remark
RV501	1-238-088-11	RES, ADJ, CERMET 2.2K	
RV501	1-238-854-11	RES, ADJ, CERMET 2.2K	
RV501	1-241-592-11	RES, ADJ, METAL GRAZE 2.2K	
RV502	1-223-565-11	RES, VAR, CARBON (4 TYPE)	
RV503	1-238-096-11	RES, ADJ CERMET 1M	
RV503	1-238-862-11	RES, ADJ, CERMET 1M	
RV503	1-241-600-11	RES, ADJ, METAL GRAZE 1M	
RV505	1-238-086-11	RES, ADJ, CERMET 470	
RV505	1-238-852-11	RES, ADJ, CERMET 470	
RV505	1-241-590-11	RES, ADJ, METAL GRAZE 470	

< TRANSFORMER >

Ref.No.	Part No.	Description	Remark
⚠T501	1-439-525-11	TRANSFORMER ASSY, FLYBACK	

< THERMISTOR >

Ref.No.	Part No.	Description	Remark
TH501	1-809-350-21	THERMISTOR, NTC (2125)	

< SOCKET >

Ref.No.	Part No.	Description	Remark
W501	1-953-265-11	HARNESS (VF-64)	
W502	1-526-978-51	SOCKET ASSY, CRT	

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* A-7063-944-A VS-110 BOARD, COMPLETE
****
(FX430/FX435/FX630)

* A-7063-982-A VS-111 BOARD, COMPLETE (FX530)
****
(Ref. No. 2,000 Series)

< CAPACITOR >

Ref.No.	Part No.	Description	Remark
C101	1-162-921-11	CERAMIC CHIP 33PF 5% 50V	
C102	1-162-922-11	CERAMIC CHIP 39PF 5% 50V	
C103	1-162-974-11	CERAMIC CHIP 0.01uF 50V	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

VS-110 VS-111

Ref.No.	Part No.	Description			Remark
C104	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C106	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C107	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C108	1-162-926-11	CERAMIC CHIP	82PF	5%	50V
C109	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C110	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C111	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C112	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C113	1-164-217-11	CERAMIC CHIP	150PF	5%	50V
C114	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C115	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C116	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C117	1-104-852-11	TANTAL. CHIP	22uF	20%	6.3V
C118	1-104-852-11	TANTAL. CHIP	22uF	20%	6.3V
C119	1-162-961-11	CERAMIC CHIP	330PF	10%	50V
C120	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C121	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C122	1-162-961-11	CERAMIC CHIP	330PF	10%	50V
C123	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C124	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C128	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C131	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C134	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C136	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C137	1-162-918-11	CERAMIC CHIP	18PF	5%	50V
C143	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C144	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C145	1-104-852-11	TANTAL. CHIP	22uF	20%	6.3V
C146	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C147	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C148	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C149	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C150	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C151	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C152	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C153	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C154	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C157	1-162-918-11	CERAMIC CHIP	18PF	5%	50V
C158	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C159	1-162-922-11	CERAMIC CHIP	39PF	5%	50V
C160	1-162-946-11	CERAMIC CHIP	27PF	5%	50V
C161	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C163	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C164	1-162-942-11	CERAMIC CHIP	12PF	5%	50V
C165	1-162-956-11	CERAMIC CHIP	180PF	5%	50V
C166	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C167	1-162-926-11	CERAMIC CHIP	82PF	5%	50V (FX530)
C167	1-164-382-11	CERAMIC CHIP	91PF	5%	50V (FX430/FX435/FX630)

Ref.No.	Part No.	Description			Remark
C168	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C169	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C172	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C177	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C178	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C179	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C190	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C203	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C204	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C205	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C206	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C207	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C208	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C209	1-126-246-11	ELECT CHIP	220uF	20%	4V
C210	1-162-961-11	CERAMIC CHIP	330PF	10%	50V
C211	1-135-091-91	TANTAL. CHIP	1uF	20%	16V
C212	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C213	1-135-176-21	TANTALUM CHIP	0.68uF	10%	20V
C214	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C215	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C216	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C217	1-135-091-91	TANTAL. CHIP	1uF	20%	16V
C218	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C220	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C222	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C223	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C225	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C226	1-162-926-11	CERAMIC CHIP	82PF	5%	50V
C227	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C228	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C229	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C230	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C231	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C234	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C235	1-126-207-11	ELECT CHIP	33uF	20%	4V
C237	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C238	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C239	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C240	1-164-392-11	CERAMIC CHIP	390PF	5%	50V
C241	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C242	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C243	1-135-091-91	TANTAL. CHIP	1uF	20%	16V
C244	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C245	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C247	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C251	1-162-956-11	CERAMIC CHIP	180PF	5%	50V
C258	1-164-346-11	CERAMIC CHIP	1uF		16V
C262	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C263	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C264	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V

Ref.No.	Part No.	Description			Remark
C265	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C266	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C267	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C268	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C271	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C272	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C273	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C274	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C275	1-162-955-11	CERAMIC CHIP	150PF	5%	50V
C276	1-162-944-11	CERAMIC CHIP	18PF	5%	50V
C278	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C279	1-164-145-11	CERAMIC CHIP	390PF	5%	50V
C281	1-162-954-11	CERAMIC CHIP	120PF	5%	50V
C282	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C284	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C285	1-135-318-11	TANTAL. CHIP	33uF	20%	4V
C286	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C287	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C289	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C290	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C291	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C299	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C301	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C305	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C307	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C310	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C312	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C319	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C322	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C323	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C324	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C328	1-164-361-11	CERAMIC CHIP	0.047uF		16V
C331	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C333	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V
C334	1-162-935-11	CERAMIC CHIP	4PF	0.25PF	50V
C500	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C501	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C502	1-164-361-11	CERAMIC CHIP	0.047uF		16V
C503	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C504	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C506	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C507	1-162-918-11	CERAMIC CHIP	18PF	5%	50V
C508	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C509	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C510	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C511	1-164-361-11	CERAMIC CHIP	0.047uF		16V
C512	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C513	1-164-361-11	CERAMIC CHIP	0.047uF		16V
C514	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C515	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C516	1-164-361-11	CERAMIC CHIP	0.047uF		16V
C518	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C519	1-164-346-11	CERAMIC CHIP	1uF		16V
C521	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C522	1-164-361-11	CERAMIC CHIP	0.047uF		16V
C523	1-164-492-11	CERAMIC CHIP	0.15uF	10%	16V
C524	1-164-492-11	CERAMIC CHIP	0.15uF	10%	16V
C526	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C527	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C528	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C529	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C530	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C531	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C532	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C533	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C534	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C535	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C536	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C537	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C538	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C539	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C540	1-162-913-11	CERAMIC CHIP	8PF	0.5PF	50V
C541	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C543	1-162-913-11	CERAMIC CHIP	8PF	0.5PF	50V
C544	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C545	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C547	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C548	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C549	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C550	1-128-530-11	ELECT CHIP	33uF	20%	10V
C552	1-164-362-11	CERAMIC CHIP	470PF	5%	50V
C559	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C560	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C561	1-128-004-11	ELECT CHIP	10uF	20%	16V
C562	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C563	1-164-816-11	CERAMIC CHIP	220PF	2%	50V
C564	1-164-816-11	CERAMIC CHIP	220PF	2%	50V
C565	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C566	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C567	1-164-173-11	CERAMIC CHIP	0.0039uF	10%	50V
C568	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C569	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C570	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C571	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C572	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C573	1-162-909-11	CERAMIC CHIP	4PF	0.25PF	50V
C951	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C952	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C953	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C955	1-162-974-11	CERAMIC CHIP	0.01uF		50V

Ref. No.	Part No.	Description	Remark
C959	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C961	1-164-346-11	CERAMIC CHIP 1uF	16V

< CONNECTOR >

Ref. No.	Part No.	Description	Remark
CN101	1-691-492-21	CONNECTOR, FFC/FPC 13P	
CN102	1-580-789-21	PIN, CONNECTOR (SMD) 6P	
CN201	1-573-353-11	CONNECTOR, FFC/FPC 13P	
CN202	1-691-536-11	CONNECTOR, BOARD TO BOARD 24P (FX430/FX435/FX630)	
* CN202	1-691-929-11	CONNECTOR, BOARD TO BOARD 34P (FX530)	
CN203	1-764-396-21	CONNECTOR, BOARD TO BOARD 42P	
CN206	1-580-789-21	PIN, CONNECTOR (SMD) 6P	
* CN502	1-764-708-11	CONNECTOR, FFC/FPC (LIF) 9P	
* CN503	1-764-717-11	CONNECTOR, FFC/FPC (LIF) 18P	
CN504	1-695-325-11	CONNECTOR, BOARD TO BOARD 42P	
* CN505	1-764-397-21	CONNECTOR, BOARD TO BOARD 42P	

< DIODE >

Ref. No.	Part No.	Description	Remark
D101	8-719-800-76	DIODE 1SS226	
D102	8-719-404-49	DIODE MA111	
D201	8-719-027-50	DIODE MA142WK	
D204	8-719-027-50	DIODE MA142WK	
D208	8-719-027-50	DIODE MA142WK	
D216	8-719-027-50	DIODE MA142WK	
D217	8-719-404-49	DIODE MA111	
D218	8-719-800-76	DIODE 1SS226	
D321	8-719-045-87	DIODE MA4Z082WA	
⚠D501	8-719-421-27	DIODE MA728	
D504	8-719-404-49	DIODE MA111	
D505	8-719-404-49	DIODE MA111	

< FILTER >

Ref. No.	Part No.	Description	Remark
FL201	1-236-757-21	FILTER, LOW PASS (C)	

< IC >

Ref. No.	Part No.	Description	Remark
IC102	8-752-069-78	IC CXA1704R	
IC201	8-752-068-58	IC CXA1700R	
IC203	8-752-351-22	IC CXL5502N	
IC205	8-752-053-21	IC CXA1211M	
IC208	8-759-710-07	IC NJM2234M	
IC501	8-759-044-78	IC AK6420F-SGX2060	
IC502	8-759-197-68	IC S-8423DFT	
IC503	8-759-267-67	IC MB89098PFV-G-107-BND	
IC505	8-752-851-37	IC CXP87132-009R	
IC506	8-759-169-11	IC CXA1575M-E2	
IC508	8-759-249-80	IC MB4470PFQ-G-BND-ER	
IC951	8-759-169-02	IC MB88344BPFV-G-BND-ER	

< COIL >

Ref. No.	Part No.	Description	Remark
L102	1-412-066-21	INDUCTOR CHIP 220uH	
L103	1-412-066-21	INDUCTOR CHIP 220uH	
L104	1-412-951-11	INDUCTOR 10uH	
L105	1-412-066-21	INDUCTOR CHIP 220uH	
L108	1-412-060-11	INDUCTOR CHIP 22uH	
L109	1-412-957-11	INDUCTOR 33uH	
L110	1-410-657-21	INDUCTOR CHIP 180uH	
L111	1-412-950-11	INDUCTOR 8.2uH	
L112	1-412-280-31	INDUCTOR 330uH	
L113	1-412-957-11	INDUCTOR 33uH	
L114	1-412-282-41	INDUCTOR 470uH	
L115	1-412-280-31	INDUCTOR 330uH	
L116	1-410-657-21	INDUCTOR CHIP 180uH	
L118	1-410-655-31	INDUCTOR CHIP 120uH	
L120	1-412-951-11	INDUCTOR 10uH	
L122	1-412-058-11	INDUCTOR CHIP 10uH	
L202	1-414-078-11	INDUCTOR 10uH	
L203	1-412-955-11	INDUCTOR 22uH	
L204	1-412-963-11	INDUCTOR 100uH	
L207	1-412-945-11	INDUCTOR 3.3uH	
L209	1-412-960-21	INDUCTOR 56uH	
L213	1-412-953-11	INDUCTOR 15uH	
L214	1-412-962-11	INDUCTOR 82uH	
L500	1-414-078-11	INDUCTOR 10uH	
L501	1-414-078-11	INDUCTOR 10uH	
L502	1-414-072-11	INDUCTOR 1uH	
L503	1-412-961-11	INDUCTOR 68uH	
L504	1-414-078-11	INDUCTOR 10uH	
L506	1-414-078-11	INDUCTOR 10uH	
L951	1-414-078-11	INDUCTOR 10uH	
L952	1-414-072-11	INDUCTOR 1uH	

< IC LINK >

Ref. No.	Part No.	Description	Remark
⚠PS500	1-576-122-21	RINK, IC 0.4A 125V	
⚠PS501	1-576-122-21	RINK, IC 0.4A 125V	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remark
Q101	8-729-905-23	TRANSISTOR 2SA1576-R	
Q102	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q103	8-729-216-22	TRANSISTOR 2SA1162	
Q104	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q105	8-729-402-42	TRANSISTOR UN5213	
Q106	8-729-402-42	TRANSISTOR UN5213	
Q109	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q111	8-729-015-74	TRANSISTOR UN5111-TX	
Q112	8-729-117-73	TRANSISTOR 2SC4178-F14	
Q113	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q114	8-729-230-63	TRANSISTOR 2SC4116-YG	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
Q115	8-729-012-50	TRANSISTOR 2SC4400-3/4/5	
Q117	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q119	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q126	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q129	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q132	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q133	8-729-012-50	TRANSISTOR 2SC4400-3/4/5	
Q134	8-729-402-42	TRANSISTOR UN5213	
Q135	8-729-402-42	TRANSISTOR UN5213	
Q202	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q204	8-729-402-42	TRANSISTOR UN5213	
Q216	8-729-402-42	TRANSISTOR UN5213	
Q217	8-729-420-12	TRANSISTOR XN4213	
Q219	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q225	8-729-015-76	TRANSISTOR UN5211-TX	
Q226	8-729-807-87	TRANSISTOR 2SB1295-UL6	
Q227	8-729-402-42	TRANSISTOR UN5213	
Q228	8-729-807-87	TRANSISTOR 2SB1295-UL6	
Q232	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q234	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q235	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q236	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q237	8-729-402-81	TRANSISTOR XN4501	
Q238	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q240	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q242	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q244	8-729-402-42	TRANSISTOR UN5213	
Q245	8-729-403-35	TRANSISTOR UN5113	
Q246	8-729-402-81	TRANSISTOR XN4501	
Q247	8-729-402-42	TRANSISTOR UN5213	
Q253	8-729-025-16	TRANSISTOR UN511D-TX	
Q254	8-729-403-35	TRANSISTOR UN5113	
Q255	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q256	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q257	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q258	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q259	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q260	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q261	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q266	8-729-402-42	TRANSISTOR UN5213	
Q267	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q500	8-729-420-24	TRANSISTOR 2SB1218A-QRS	(FX530)
Q501	8-729-403-27	TRANSISTOR XN4401	
Q502	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q503	8-729-402-81	TRANSISTOR XN4501	
Q504	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q506	8-729-402-42	TRANSISTOR UN5213	
Q507	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q951	8-729-101-07	TRANSISTOR 2SB798	
Q952	8-729-230-63	TRANSISTOR 2SC4116-YG	

Ref. No.	Part No.	Description	Remark
Q956	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q958	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q960	8-729-230-63	TRANSISTOR 2SC4116-YG	

< RESISTOR >

Ref. No.	Part No.	Description	Remark
R101	1-216-864-11	METAL CHIP 0 5% 1/16W	
R102	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R103	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R104	1-216-819-11	METAL CHIP 680 5% 1/16W	
R105	1-216-819-11	METAL CHIP 680 5% 1/16W	
R106	1-216-814-11	METAL CHIP 270 5% 1/16W	
R107	1-216-813-11	METAL CHIP 220 5% 1/16W	
R108	1-216-800-11	METAL GLAZE 18 5% 1/16W	
R109	1-216-804-11	METAL CHIP 39 5% 1/16W	
R110	1-216-818-11	METAL CHIP 560 5% 1/16W	
R111	1-218-875-11	METAL CHIP 15K 0.50% 1/16W	
R112	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R114	1-216-828-11	METAL CHIP 3.9K 5% 1/16W	
R118	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R119	1-216-864-11	METAL CHIP 0 5% 1/16W	
R120	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R122	1-216-853-11	METAL CHIP 470K 5% 1/16W	
R123	1-216-833-11	METAL CHIP 10K 5% 1/16W	(FX530)
R123	1-216-836-11	METAL CHIP 18K 5% 1/16W	(FX430/FX435/FX630)
R124	1-216-864-11	METAL CHIP 0 5% 1/16W	
R126	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R127	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R128	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R130	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R132	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R133	1-216-819-11	METAL CHIP 680 5% 1/16W	
R134	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R135	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R136	1-216-820-11	METAL CHIP 820 5% 1/16W	
R137	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R138	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R139	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R140	1-216-813-11	METAL CHIP 220 5% 1/16W	
R141	1-216-817-11	METAL CHIP 470 5% 1/16W	
R142	1-216-818-11	METAL CHIP 560 5% 1/16W	
R143	1-216-808-11	METAL CHIP 82 5% 1/16W	
R144	1-216-818-11	METAL CHIP 560 5% 1/16W	
R146	1-216-809-11	METAL CHIP 100 5% 1/16W	
R147	1-216-864-11	METAL CHIP 0 5% 1/16W	
R148	1-216-813-11	METAL CHIP 220 5% 1/16W	
R149	1-216-813-11	METAL CHIP 220 5% 1/16W	
R150	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R151	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R152	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	

Ref.No.	Part No.	Description				Remark
R153	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	(FX430/FX435/FX630)
R153	1-216-833-11	METAL CHIP	10K	5%	1/16W	(FX530)
R154	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R158	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R159	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R160	1-216-818-11	METAL CHIP	560	5%	1/16W	
R162	1-216-818-11	METAL CHIP	560	5%	1/16W	
R163	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R164	1-216-864-11	METAL CHIP	0	5%	1/16W	
R165	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R166	1-216-816-11	METAL CHIP	390	5%	1/16W	
R171	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R175	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R178	1-216-809-11	METAL CHIP	100	5%	1/16W	
R179	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R180	1-216-809-11	METAL CHIP	100	5%	1/16W	
R181	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R185	1-216-847-11	METAL CHIP	150K	5%	1/16W	
R186	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R187	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R188	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R189	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R193	1-216-815-11	METAL CHIP	330	5%	1/16W	
R194	1-216-818-11	METAL CHIP	560	5%	1/16W	
R195	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R196	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R197	1-216-864-11	METAL CHIP	0	5%	1/16W	
R201	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R202	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R203	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R205	1-216-864-11	METAL CHIP	0	5%	1/16W	
R206	1-216-864-11	METAL CHIP	0	5%	1/16W	
R207	1-216-804-11	METAL CHIP	39	5%	1/16W	
R209	1-216-814-11	METAL CHIP	270	5%	1/16W	
R210	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R211	1-216-803-11	METAL CHIP	33	5%	1/16W	
R213	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R214	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R215	1-216-819-11	METAL CHIP	680	5%	1/16W	
R216	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R218	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R219	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R220	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R221	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R222	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R223	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R224	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R226	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R230	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R231	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R232	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R234	1-216-864-11	METAL CHIP	0	5%	1/16W	
R235	1-218-877-11	METAL CHIP	18K	0.50%	1/16W	
R241	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R245	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R246	1-216-819-11	METAL CHIP	680	5%	1/16W	
R247	1-216-815-11	METAL CHIP	330	5%	1/16W	
R253	1-218-849-11	METAL CHIP	1.2K	0.50%	1/16W	
R255	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R256	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R259	1-218-859-11	METAL CHIP	3.3K	0.50%	1/16W	
R261	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R262	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R263	1-218-839-11	METAL GLAZE	470	0.50%	1/16W	
R265	1-216-818-11	METAL CHIP	560	5%	1/16W	
R272	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R273	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R274	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R275	1-216-295-00	METAL CHIP	0	5%	1/10W	
R276	1-216-296-91	METAL GLAZE	0	5%	1/8W	
R279	1-216-819-11	METAL CHIP	680	5%	1/16W	
R280	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R282	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R283	1-216-864-11	METAL CHIP	0	5%	1/16W	
R285	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R286	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R288	1-216-844-11	METAL CHIP	82K	5%	1/16W	
R289	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R290	1-216-864-11	METAL CHIP	0	5%	1/16W	
R291	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R295	1-216-864-11	METAL CHIP	0	5%	1/16W	
R296	1-216-815-11	METAL CHIP	330	5%	1/16W	
R297	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R300	1-216-817-11	METAL CHIP	470	5%	1/16W	
R302	1-216-864-11	METAL CHIP	0	5%	1/16W	
R303	1-216-810-11	METAL CHIP	120	5%	1/16W	
R304	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R305	1-216-820-11	METAL CHIP	820	5%	1/16W	
R307	1-216-813-11	METAL CHIP	220	5%	1/16W	
R308	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R309	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R312	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R313	1-216-817-11	METAL CHIP	470	5%	1/16W	
R314	1-216-864-11	METAL CHIP	0	5%	1/16W	
R315	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R316	1-216-815-11	METAL CHIP	330	5%	1/16W	
R317	1-216-820-11	METAL CHIP	820	5%	1/16W	
R318	1-216-820-11	METAL CHIP	820	5%	1/16W	
R319	1-216-818-11	METAL CHIP	560	5%	1/16W	

Ref.No.	Part No.	Description				Remark
R321	1-216-813-11	METAL CHIP	220	5%	1/16W	
R322	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R323	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R324	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R325	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R326	1-216-813-11	METAL CHIP	220	5%	1/16W	
R328	1-216-820-11	METAL CHIP	820	5%	1/16W	
R329	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R331	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R333	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R334	1-216-815-11	METAL CHIP	330	5%	1/16W	
R338	1-216-812-11	METAL CHIP	180	5%	1/16W	
R339	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R342	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R347	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R348	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R349	1-216-864-11	METAL CHIP	0	5%	1/16W	
R354	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R357	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R364	1-216-864-11	METAL CHIP	0	5%	1/16W	
R366	1-216-864-11	METAL CHIP	0	5%	1/16W	
R368	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R373	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R377	1-216-864-11	METAL CHIP	0	5%	1/16W	
R378	1-216-864-11	METAL CHIP	0	5%	1/16W	
R380	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R381	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R383	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R387	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R391	1-216-864-11	METAL CHIP	0	5%	1/16W	
R398	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R399	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R500	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R501	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R502	1-216-295-00	METAL CHIP	0	5%	1/10W	
R503	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R505	1-216-864-11	METAL CHIP	0	5%	1/16W	
R506	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R507	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R508	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R509	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R510	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R511	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R512	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R513	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R514	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R515	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R517	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R518	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R519	1-216-817-11	METAL CHIP	470	5%	1/16W	
R520	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R522	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R523	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R525	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R526	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R527	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R528	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R529	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R530	1-216-019-00	METAL CHIP	56	5%	1/10W	
R531	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R532	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R533	1-217-671-11	METAL CHIP	1	5%	1/10W	
R534	1-217-671-11	METAL CHIP	1	5%	1/10W	
R535	1-217-671-11	METAL CHIP	1	5%	1/10W	
R536	1-217-671-11	METAL CHIP	1	5%	1/10W	
R537	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R538	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R539	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R540	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R541	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R542	1-216-864-11	METAL CHIP	0	5%	1/16W	
R543	1-216-864-11	METAL CHIP	0	5%	1/16W	
R544	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R546	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R548	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R549	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R550	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R551	1-216-864-11	METAL CHIP	0	5%	1/16W	
R552	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R553	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R554	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R555	1-216-864-11	METAL CHIP	0	5%	1/16W	
R556	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R558	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R560	1-216-296-91	METAL GLAZE	0	5%	1/8W	
R561	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R562	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R563	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R567	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R569	1-216-845-11	METAL CHIP	100K	5%	1/16W	(FX530)
R570	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R572	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R573	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R574	1-216-845-11	METAL CHIP	100K	5%	1/16W	(FX430/FX435/FX630)
R575	1-216-864-11	METAL CHIP	0	5%	1/16W	
R577	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R578	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R579	1-216-864-11	METAL CHIP	0	5%	1/16W	
R580	1-216-845-11	METAL CHIP	100K	5%	1/16W	

Ref. No.	Part No.	Description	Remark
R581	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R582	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R583	1-216-833-11	METAL CHIP 10K 5% 1/16W	(FX430/FX435/FX630)
R584	1-216-864-11	METAL CHIP 0 5% 1/16W	
R585	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R586	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R587	1-216-853-11	METAL CHIP 470K 5% 1/16W	
R588	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R589	1-216-864-11	METAL CHIP 0 5% 1/16W	
R591	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R592	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R593	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R594	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R595	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R596	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R597	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R954	1-216-138-00	METAL CHIP 3.3 5% 1/8W	
R955	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R956	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R957	1-216-820-11	METAL CHIP 820 5% 1/16W	
R961	1-216-818-11	METAL CHIP 560 5% 1/16W	
R962	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R964	1-216-822-11	METAL CHIP 1.2K 5% 1/16W	
R965	1-216-826-11	METAL CHIP 2.7K 5% 1/16W	
R966	1-216-826-11	METAL CHIP 2.7K 5% 1/16W	
R967	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R968	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R972	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R1400	1-216-864-11	METAL CHIP 0 5% 1/16W	
R1401	1-216-864-11	METAL CHIP 0 5% 1/16W	
R1403	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R1404	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R1406	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R2002	1-216-864-11	METAL CHIP 0 5% 1/16W	(FX630)
R2003	1-216-864-11	METAL CHIP 0 5% 1/16W	(FX530)

< NETWORK >

Ref. No.	Part No.	Description	Remark
RB500	1-236-436-11	NETWORK, RES 100K	
RB501	1-236-432-11	NETWORK, RES 47K	
RB502	1-236-971-11	NETWORK, RES 0	
RB503	1-236-432-11	NETWORK, RES 47K	
RB504	1-236-412-11	NETWORK, RES 1.0K	
RB505	1-236-412-11	NETWORK, RES 1.0K	
RB506	1-236-412-11	NETWORK, RES 1.0K	
RB507	1-236-448-11	NETWORK, RES 1.0M	
RB508	1-236-436-11	NETWORK, RES 100K	
RB509	1-236-444-11	NETWORK, RES 470K	
RB510	1-236-412-11	NETWORK, RES 1.0K	
RB512	1-236-412-11	NETWORK, RES 1.0K	
RB513	1-236-971-11	NETWORK, RES 0	
RB514	1-236-907-11	RESISTOR, NETWORK (CHIP TYPE)	
RB515	1-236-904-11	RESISTOR, NETWORK (CHIP TYPE)	
RB516	1-236-904-11	RESISTOR, NETWORK (CHIP TYPE)	
RB518	1-236-971-11	NETWORK, RES 0	
RB519	1-236-971-11	NETWORK, RES 0	
RB520	1-236-904-11	RESISTOR, NETWORK (CHIP TYPE)	
RB521	1-236-412-11	NETWORK, RES 1.0K	
RB522	1-236-448-11	NETWORK, RES 1.0M	
RB523	1-236-432-11	NETWORK, RES 47K	
RB524	1-236-908-11	RESISTOR, NETWORK (CHIP TYPE)	
RB525	1-236-424-11	NETWORK, RES 10K	
RB526	1-236-908-11	RESISTOR, NETWORK (CHIP TYPE)	
RB527	1-236-424-11	NETWORK, RES 10K	
RB528	1-236-424-11	NETWORK, RES 10K	
RB529	1-236-424-11	NETWORK, RES 10K	
RB530	1-236-424-11	NETWORK, RES 10K	
RB531	1-236-424-11	NETWORK, RES 10K	
RB532	1-236-424-11	NETWORK, RES 10K	
RB533	1-236-412-11	NETWORK, RES 1.0K	
RB534	1-236-412-11	NETWORK, RES 1.0K	
RB535	1-236-908-11	RESISTOR, NETWORK (CHIP TYPE)	
RB536	1-236-412-11	NETWORK, RES 1.0K	
RB537	1-236-412-11	NETWORK, RES 1.0K	
RB542	1-236-412-11	NETWORK, RES 1.0K	
RB543	1-236-412-11	NETWORK, RES 1.0K	
RB544	1-236-412-11	NETWORK, RES 1.0K	
RB547	1-236-444-11	NETWORK, RES 470K	(FX530)
RB548	1-236-416-11	NETWORK, RES 2.2K	
RB549	1-236-971-11	NETWORK, RES 0	
RB550	1-236-971-11	NETWORK, RES 0	
RB551	1-236-412-11	NETWORK, RES 1.0K	
RB552	1-236-412-11	NETWORK, RES 1.0K	
RB553	1-236-412-11	NETWORK, RES 1.0K	
RB554	1-236-971-11	NETWORK, RES 0	
RB555	1-236-971-11	NETWORK, RES 0	

< VARIABLE RESISTOR >

Ref. No.	Part No.	Description	Remark
RV202	1-238-086-11	RES, ADJ, CERMET 470	

< VIBRATOR >

Ref. No.	Part No.	Description	Remark
X201	1-579-365-21	VIBRATOR, CRYSTAL (3.58MHz)	
X501	1-579-550-11	VIBRATOR, CRYSTAL (32kHz)	
X502	1-760-314-11	VIBRATOR, CRYSTAL (11.895MHz)	
XTL501	1-579-369-21	VIBRATOR (10MHz)	

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6-6. INTERFACE

6-6-1. System Control – Video/Audio Block Interface (VS BOARD)

NAME	I/O	No.	VTR MODE				CAMERA MODE	
			STOP	FF	REW	PB	STAND BY	REC
SP/$\overline{\text{LP}}$	O	IC505 (71)	H	H	H	*2	H	H
VA PB MODE	O	IC505 ㉟	L	L	L	H	L	L
AUDIO MUTE *13	O	IC505 ㊻	L	L	L	L	L	L
VIDEO MUTE	O	IC505 ㊼	L	*14	*14	*15	L	L
CAM/$\overline{\text{LINE}}$	O	IC505 ㉖	L	L	L	L	H	H
JOG VD	O	IC505 ③	L	L	L	L	L	L
RP PB MODE	O	IC505 ①	H	H	H	H	H	L
$\overline{\text{FE ON}}$	O	IC505 ②	H	H	H	H	H	L
RF SWP	O	IC505 (97)	L	*7	*7	*7	*7	*7
JOG	O	IC505 ④	L	L	L	L	L	L
$\overline{\text{CS VIDEO}}$	O	IC505 ㉞	V period "L" pulse					
CS DA	O	IC505 ㊲	V period 'H" pulse					
DATA TO SLVE	O	IC503 (76)	V period pulse train					
$\overline{\text{MODECON SCK}}$	I	IC503 (77)	V period pulse train					
SP/$\overline{\text{LP}}$ DET	I	IC505 (81)	L	*10	*10	L	H	H
CLOG DET	I	IC505 (82)	L	*11	*11	*11	*11	H
VTR SYNC	I	IC505 (64)	L	*12	*12	*12	*12	*12
COMP REC	O	IC505 ㉕	L	H	H	L	L	L

*2. Outputs discrimination result of the playback tape. "H" : SP mode, "L": LP mode.
*7. 30 Hz duty 50% pulse (synchronized with drum rotation)
*10. "H": SP recording area on tape. "L": LP recording area.
*11. "H": no recording area.
*12. Composite sync signal.
*14. "L" when external input (video) present.
*15. "H" when tape no signal.

6-6-2. System Control – Servo Block Interface

NAME	I/O	No.	VTR MODE				CAMERA MODE	
			STOP	FF	REW	PB	STAND BY	REC
T.REEL FG	I	IC505 (60)	–	*1	*1	*1	–	*1
S.REEL FG	I	IC505 (59)	–	*1	*1	*1	–	*1
ATF ERROR	I	IC505 (58)	–	*2	*2	*2	*2	*2
DRUM PG	I	IC505 (66)	–	*3	*3	*3	*3	*3
DRUM FG	I	IC505 (67)	–	*4	*4	*4	*4	*4
CAP FG/CFG HMS	I	IC505 (68), (75)	–	*5	*5	*5	*5	*5
CAP ON	O	IC505 (99)	L	H	H	H	L	H
REF PILOT	O	IC505 (83)	*7	*6	*6	*6	*6	*6
RP PB MODE	O	IC505 ①	H	H	H	H	H	L
DRUM RVS *10	O	IC505 ㉝	H	H	H	H	H	H
CAP FWD/$\overline{\text{RVS}}$	O	IC505 (100)	L	H	L	H	L	H
DRUM PWM	O	IC505 (74)	L	*9	*9	*9	*9	*9
CAP PWM	O	IC505 (73)	L	*9	*9	*9	L	*9
$\overline{\text{LM LIM CONT}}$ *11	O	IC505 ㉛	L	L	L	L	L	L
DRUM ON *14	O	IC505 ㉜	L	H	H	H	H	H
DRUM ACC	O	IC505 (89)	L	L	L	L	L	L
DRUM BRK	O	IC505 (90)	L	L	L	L	L	L

*1. Inputting waveform.
*2. ATF error voltage input.
*3. One PG pulse input.
*4. FG pulses input.
*5. FG pulses input.
*6. Four frequencies.
*7. f_1 (102.54 kHz) or f_3 (165.21 kHz) output
*9. PWM signal.
*10. Normally "H". Temporary "L" when load (drum reverse rotation).
*11. Temporary "H" when cassette loading (finger catch protection).
*14. "H": approx. 1.3 Vdc.

1-2. CAMERA SYSTEM ADJUSTMENT

1. Power Supply Voltage Check (DD board)

Subject	Option
Measuring instrument	Digital voltmeter
D5V check	
Measurement point	Pins ㉙ of CN901
Specified value	4.9 ± 0.1 Vdc
D3.6V check	
Measurement point	Pins ㉑ and ㉒ of CN901
Specified value	3.6 ± 0.1 Vdc
CAM 5V check	
Measurement point	Pins ㉕ and ㉖ of CN901
Specified value	4.85 ± 0.1 Vdc
CAM 15V check	
Measurement point	Pin ㉗ of CN901
Specified value	15 ± 0.3 Vdc
CAM –9V check	
Measurement point	Pin ㉛ of CN901
Specified value	$-8.5^{+0.25}_{-0.4}$ Vdc

Checking method:

1) Check that each power supply voltage satisfies the specified value.

2. Page F Data Initialization

Note: It is necessary to perform all adjustments of the camera section from the beginning again if the data of page F has been initialized.

Initializing method:

1) Page: 6, address: 00, data: 01
2) Check that the data of page: 6, address: 11 is 00.
3) Set data: 2D to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
4) Check that the data of page: 6, address: 11 is 01.
5) Set data: 00 to page: 6, address: 01. and press the PAUSE button of the adjusting remote commander.
6) After performing "Page F data modification", perform all the adjustments of the camera section (page F).

3. Page F Data Modification 1

The data (initial data) that is automatically written on page F after the initialization of the page F data will differ according to some camera micro processor versions. Change the data by manual input, and arrange it.

Note 1: When changing the data, to write the data to the non-volatile memory, press the PAUSE button of the adjusting remote commander every time the new data is set.

Note 2: When changing address: 00, set the data of page: 6, address: 00 to 80.

CCD-FX430/FX435/FX530

Address	Data
00	62
01	02
03	00
1C	0E
25	A5
27	3A
28	A2
2A	0C
2B	58
2E	17
2F	22
30	08
32	50
34	00
3B	20
3D	03
50	02
54	66
57	66
58	59
5E	1E
60	3A
77	E0
9C	91
A4	02
BD	70
BE	35
BF	54

CCD-FX630

Address	Data
00	60
1C	0E
20	79
21	79
27	3A
28	A2
2F	27
30	08
32	47
3B	20
3D	02
50	32
77	E0
9C	91
A4	02
B1	25
B3	25
B4	A2
BD	6E
BE	32
BF	54

[Distinguishing the Camera Micro Computer (IC602) Versions]

Each version can be distinguished by looking at the part name of the camera micro processor or the data of page: 6, address: 10.

Version	Part Name	Page: 6 Address: 10
Ver.1.0	SC424608	10

[Distinguishing the Steady Shot Control Micro Computer (IC777) Versions] (CCD-FX630)

Each version can be distinguished by looking at the part name of the steady shot control micro processor or the data of page: 6, address: 30.

Version	Part Name	Page: 6 Address: 30
Ver.1.0	CXP87132-010R	01

4. Page F Data Modification 2 (CCD-FX630)

Change the data of page: F, address: 2B according to the type of IC used for the camera core (IC609).

Changing Method:

1) Page: 6, address: 00, data: 01
2) Set data: 16 to page: 6, address: 02.
3) Select page: A.
4) Read the data displayed on the adjusting remote commander (4 digits) and take the second number as X.
5) When X is 2, set 53 to page: F, address: 2B. When X is 6, set 50.
6) Press the PAUSE button of the adjusting remote commander.

5. 28 MHz Original Oscillation Adjustment (VC board)

Adjust the 28 MHz oscillation of the synchronization clock.
If the oscillation is not 28 MHz, the period will be inaccurate or the image will not be in color.

Subject	Not required
Measurement Point	TP709 (CL)
Measuring Instrument	Frequency counter
Adjusting Element	CT701
Specified Value	14318181 ± 71 Hz

Adjusting method:

1) Use CT701 to adjust the oscillation frequency to 14318181 ± 71 Hz.

6. V SUB Adjustment

Set the CCD imager V SUB voltage to the voltage specified for the imager.

Subject	Not required
Adjustment Page	F
Adjustment Address	04

Adjusting Method:

1) Read the V SUB voltage code of the CCD imager.
   Obtain the corresponding V SUB data from the following table.
2) Release the protect.
   Page: 6, address: 00, data: 01
3) Set the V SUB data to page: F, address: 04.
4) Press the PAUSE button of the adjusting remote commander.

V SUB			V SUB		
Voltage Code	**Data**	**Voltage (Vdc) *1**	**Voltage Code**	**Data**	**Voltage (Vdc) *1**
e	6F	9.0	q	AD	14.0
f	75	9.5	r	B3	14.5
g	7B	10.0	s	B9	15.0
h	82	10.5	t	C0	15.5
j	88	11.0	u	C6	16.0
k	8E	11.5	v	CC	16.5
l	94	12.0	w	D2	17.0
m	9A	12.5	x	D8	17.5
n	A1	13.0	y	DF	18.0
p	A7	13.5	z	E5	18.5

*1: The V SUB voltages (TP703) given are reference values.

7. VRG Adjustment

Set the CCD imager V RG voltage to the voltage specified for the imager.

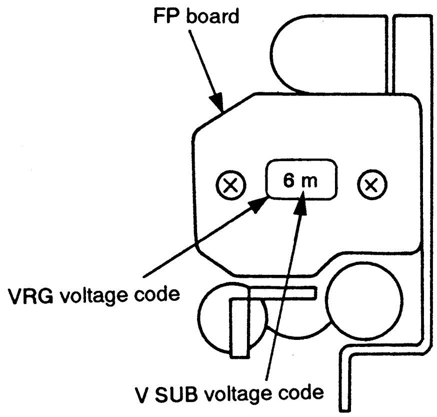
Subject	Not required
Adjustment Page	F
Adjustment Address	05 (V PGH)

Adjusting Method:

1) Read the VRG voltage code of the CCD imager.
   Obtain the corresponding VRG data from the following table.
2) Release the protect.
   Page: 6, address: 00, data: 01
3) Set the VRG data to page: F, address: 05.
4) Press the PAUSE button of the adjusting remote commander.

VRG		
Voltage Code	**Data**	**Voltage (Vdc) *2**
1	33	1.0
2	4E	1.5
3	69	2.0
4	84	2.5
5	9F	3.0
6	BA	3.5
7	D5	4.0

*2: The VRG voltages (TP707) given are reference values.



(Example) When "6m" is displayed:
The V SUB voltage code is "m" and therefore the V SUB data will be "9A".
The VRG voltage code is "6" and therefore the VRG data will be "BA".

Fig. 7-1-7.

8. Flange Back Adjustment

The flange back adjustment for the inner focus lens is performed automatically.

Subject	Chart for flange back adjustment (2000 ± 5 mm from the front side of the lens Luminance: 300 ± 50 lux)
Measurement Point	Check the operations on the TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	16, 17, 18, 19, 1A, 1B

Adjusting method:

1) Check that the flange back adjustment chart center and the exposure display center coincide at both zoom lens TELE end and WIDE end.
2) Page: 6, address: 00, data: 01
3) Check that the data of page: 6, address: 21 is 00.
4) Check that the page: F, address: 16 to 1B data is at the initial value. (Refer to Table 7-1-4. "Page F address list")
5) Set data: 13 to page: 6, address: 01 and press the PAUSE button of the adjusting remote commander.
6) Set data: 15 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
   (The adjustment data is automatically input to page: F, addresses: 16 to 1B.)
7) Check that the data of page: 6, address: 21 is 01.
   (Display indicating flange back adjustment completion)

Processing after completing adjustments

1) Turn off the main power supply (6.3V).

9. Flange Back Check

Subject	Siemens star (2m from the front of the lens)
Measurement Point	DDS display of EVF or TV monitor
Measuring Instrument	
Specified Value	Focused at the TELE end and WIDE end.

Checking method:

1) Place the Siemens star 2m from the front of the lens.
2) To open the IRIS, decrease the luminous intensity to the Siemens star up to a point before noise appears on the image.
3) Shoot the siemens star with the zoom TELE end.
4) Turn ON the auto focus.
5) When the lens is focused, turn OFF the auto focus. (Note 2)
6) Shoot the siemens star with the zoom WIDE end.
7) Check that the lens is focused.

Note 1: Input the following data for CCD-FX630.
1) Set data: 02 to page: 6, address: 32.
2) Set data: 01 to page: 6, address: 33.

Note 2: When the auto focus is ON, the lens can be checked if it is focused or not by observing the data on page A of the adjusting remote commander.
1) Set data: 0C to page: 6, address: 02.
2) Page A shows the state of the focus.

A : 00 : XX
→ (Odd: Focused
Even: Unfocused)

Processing after compleating adjustments

1) Set data: 00 to page: 6, address: 02.

For CCD-FX630

2) Set data: 00 to page: 6, address: 32.
3) Set data: 00 to page: 6, address: 33.

10. HALL Adjustment

To eliminate the differences in the outputs of the hall element attached to the iris for detecting the position of the lens iris, adjust the hall AMP gain and hall offset.

Subject	Not required
Measurement Point	DDS display of LCD or monitor TV
Measuring Instrument	
Adjustment Page	F
Adjustment Address	06, 07
Specified Value	32 to 36 during IRIS OPEN B4 to B8 during IRIS CLOSE

Adjusting method:

1) Page: 6, address: 00, data: 01
2) Page: 1, address: 00, data: 01
3) Set data: 21 to page: D, address: 03, and press the PAUSE button of the adjusting remote commander.
4) Set data: 03 to page: 6, address: 02.
5) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
6) Set data: 80 to page: F, address: 07, and press the PAUSE button of the adjusting remote commander.
7) Set data: 40 to page: F, address: 06, and press the PAUSE button of the adjusting remote commander.
8) Read the DDS display data (the bottom two digits of the display data at the bottom right of the EVF or the monitor TV display), and set to W_2.
9) Set data: 30 to page: F, address: 06, and press the PAUSE button of the adjusting remote commander.
10) Read the DDS display data, and set to W_1.
11) Set data: 01 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
12) Read the DDS display data, and set to K_1.
13) Set data: 40 to page: F, address: 06, and press the PAUSE button.
14) Read the DDS display data, and set to K_2.
15) Convert W_1, W_2, K_1, K_2 to decimal notation, and obtain W_1', W_2', K_1', K_2'. (Refer to Table 7-1-5. "Hexadecimal notation-decimal notation conversion table".)
16) Calculate X_1' using the following equations (decimal notation calculation).

$$A' = W_2' + K_1' - W_1' - K_2' \cdots\cdots \text{Equation 1}$$

$$B' = W_1' - K_1' \cdots\cdots \text{Equation 2}$$

$$X_1' = \frac{2080 + (48 \times A') - (16 \times B')}{A'} \cdots\cdots \text{Equation 3}$$

17) Convert X_1' to hexadecimal notation, and obtain X_1. (Round off to one decimal place)
18) Set data: X_1 to page: F, address: 06, and press the PAUSE button of the adjusting remote commander.
19) Change the data of page: F, address: 07, and adjust the DDS display data to "34".
20) Press the PAUSE button of the adjusting remote commander.
21) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
22) Read the DDS display data, and set to W_0. If W_0 lies within the "B4" to "B8" range, perform "Processing after completing adjustments". If it lies outside the range, perform the following adjustments.
23) Convert W_0 to hexadecimal notation, and obtain W_0'.
24) Calculate X_2' using the following equations (decimal notation calculation).

$$C' = W_0' - B' - 52 \cdots\cdots \text{Equation 4}$$

$$X_2' = \frac{(130 - B') \times (X_1' - 48) + 48 \times C'}{C'} \cdots\cdots \text{Equation 5}$$

(X_1' and B' are values obtained from equations 2 and3)

25) Convert X_2' to hexadecimal notation and obtain X_2. (Round off to one decimal place)
26) Set data X_2 to page: F, address: 06, and press the PAUSE button of the adjusting remote commander.
27) Change the data of page: F, address: 07, and adjust the DDS display data to "B6".
28) Press the PAUSE button of the adjusting remote commander.
29) Set data: 01 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
30) Check that the DDS display data lies within the "32" to "36" range.

Processing after Completing Adjustments

1) Set data: 00 to page: D, address: 03, and press the PAUSE button of the adjusting remote commander.
2) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
3) Page D protect mode setting.
   Page: 1, address: 00, data: 00

11. SYNC Level Check (VC board)

Subject	Not required
Measurement Point	TP607
Measuring Instrument	Oscilloscope
Specified Value	A=140 ± 10 mV

Adjusting method:

1) Page: 6, address: 00, data: 01
2) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
3) Check that the SYNC level (A) satisfies the specified value.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.

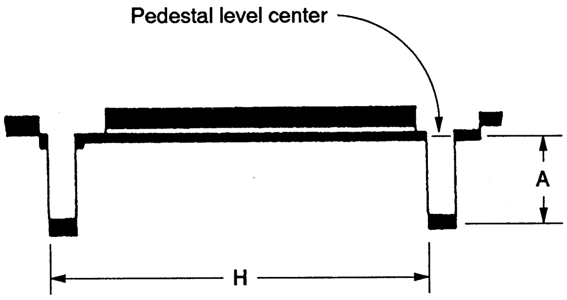


Fig. 7-1-8.

12. BURST Level Check (VC board)

Subject	Not required
Measurement Point	TP609
Measuring Instrument	Oscilloscope
Specified Value	A=140 ± 15 mVp-p

Adjusting method:

1) Page: 6, address: 00, data: 01
2) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
3) Check that the Burst level (A) satisfies the specified value.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.

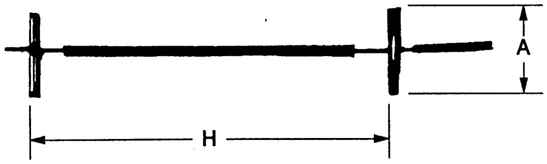


Fig. 7-1-9.

13. Picture Frame Setting

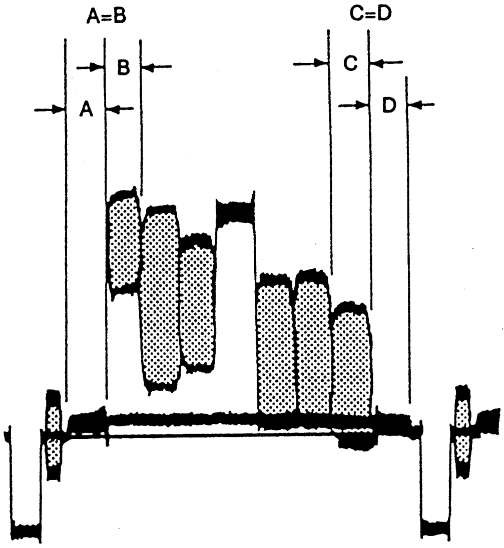
Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Oscilloscope and TV monitor.
Specified Value	A=B, C=D, t=0 ± 0.1 msec

Setting method:

1) Turn the auto focus off.
2) Adjust the focus.
3) Adjust the zoom and the camera direction, and set to the specified position.
4) Mark the position of the picture frame on the monitor display, and adjust the picture frame to this position in following adjustments using "color bar chart standard picture frame".

Check on the oscilloscope

1. horizontal period



2. Vertical period

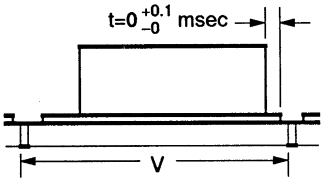


Fig. 7-1-10.

Check on the TV monitor

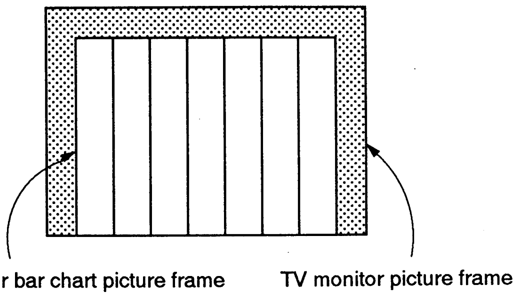


Fig. 7-1-11.

14. Color Reproduction Adjustment

Adjust the color separation matrix coefficient so that the proper color reproduction is produced.

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	08, 09, 0A, 0B
Specified Value	All color luminance points should settle within each color reproduction frame.

Adjusting method:

1) Page: 6, address: 00, data: 01
2) Set data: 00 to page: 6, address: 03.
3) Set data: F1 to page: F, address: 10, and press the PAUSE button of the adjusting remote commander.
4) Adjust the GAIN and PHASE of the vectorscope, and adjust the burst luminance point to the burst position of the color reproduction frame.
5) Change the data of addresses 08, 09, 0A and 0B of page: F, and settle each color luminance point in each color reproduction frame.

   Note 1: Be sure to press the PAUSE button of the adjusting remote commander before changing the addresses.

   If not, the new data will not be written to the memory.
6) Press the PAUSE button of the adjusting remote commander.

Processing after completing adjustments

1) Set data: 00 to page: F, address: 10 and press the PAUSE button of the adjusting remote commander.
2) Set data: 10 to page: 6, address: 03.

For CCD-FX430/FX435/FX530

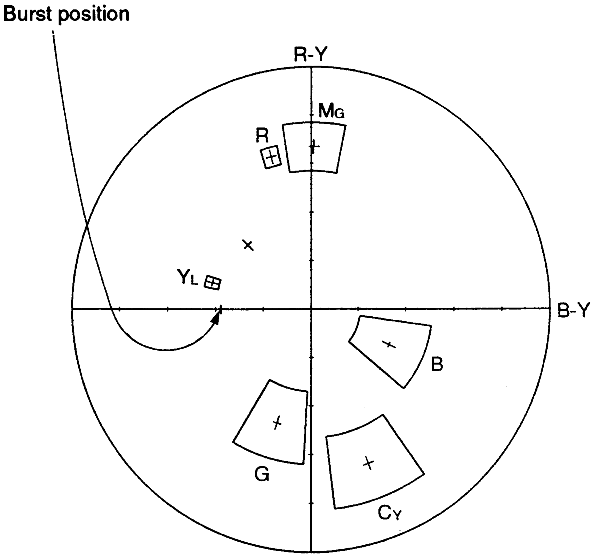


Fig. 7-1-12.

For CCD-FX630

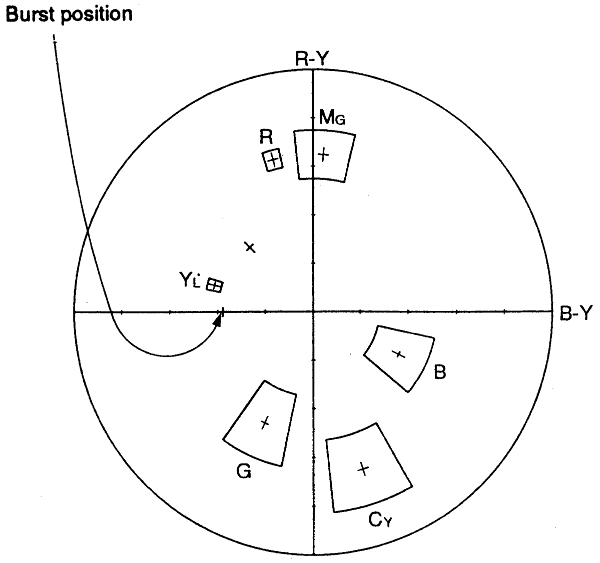


Fig. 7-1-13.

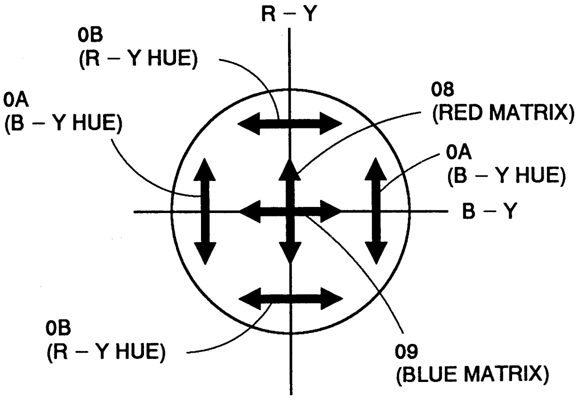


Fig. 7-1-14. Direction of the Movements of the Adjustment Address and Luminance Point

15. IRIS IN/OUT Adjustment (VC board)

For the unit to judge if the white balance is indoors or outdoors in auto white balance operations, measure the light level and write it in the EEPROM.

If the level is not correct, the white balance will not be accurate.

Subject	White pattern
Measurement Point	DDS display of EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	13, 14

Adjusting method:

1) Page: 6, address: 00, data: 01
2) Release the page D protect.
   Page: 1, address: 00, data: 01
3) Set data: 21 to page: D, address: 03, and press the PAUSE button of the adjusting remote commander.
4) Set data: 0E to page: 6, address: 02.
5) Set data: 0B to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
6) Read the DDS display data (Note 1), and take the upper two digits as D_1 and the lower two as D_2.
7) Convert D_1 to a decimal number and obtain D_1'. (Refer to Table 7-1-3. "Hexadecimal Notation-Decimal Notation Conversion Table".)
8) Calculate D_3' using the following equations. (Equations 1 and 2 are for decimal notation calculation)
   When $D_2 \geqq$ D0
   $D_3'=D_1'-21$ ································ Equation 1
   When $D_2 <$ D0
   $D_3'=D_1'-22$ ································ Equation 2
9) Convert D_3' to a hexadecimal number and obtain D_3.
10) Set D_3 to page: F, address: 13, and press the PAUSE button of the adjusting remote commander.
11) Set data: 09 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
    (IND0.5 SHUTTER mode setting)
12) Read the DDS display data (Note 1), and take the upper two digits as D_4 and the lower two as D_5.
13) Convert D_4 to a decimal number and obtain D_4'. (Refer to Table 7-1-3. "Hexadecimal Notation-Decimal Notation Conversion Table".)
14) Calculate D_6' using the following equations. (Equations 3 and 4 are for decimal notation calculation)
    When $D_5 \geqq$ F0
    $D_6'=D_4'-13$ ································ Equation 3
    When $D_5 <$ F0
    $D_6'=D_4'-14$ ································ Equation 4
15) Convert D_6' to a hexadecimal number and obtain D_6.
16) Set D_6 to page: F, address: 14, and press the PAUSE button of the adjusting remote commander.

Note 1: The right four digits of the display data at the right bottom side of the EVF and monitor TV is the LIGHT LEVEL data. If the lower digits change severely and cannot be read, record it on a tape once, play it back by frame feeding, and obtain the average value.

Processing after Completing Adjustments

1) Set data: 00 to page: D, address: 03, and press the PAUSE button of the adjusting remote commander.
2) Set data: 00 to page: 1, address: 00.
3) Set data: 00 to page: 6, address: 00, and press the PAUSE button of the adjusting remote commander.
4) Set data: 00 to page: 6, address: 02.

16. MAX GAIN Adjustment (VC board)

Correct the differences in the minimum illuminance.

If the illuminance is not consistent, the image level required for taking subjects in low illuminance will not be produced (dark).

Subject	White pattern standard picture frame
Measurement Point	TP607 (CAM Y)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	15
Specified Value	CCD-FX430/FX435/FX530 A=275 ± 10 mV CCD-FX630 A=195 ± 10 mV

Adjusting method:

1) Page: 6, address: 00, data: 01
2) Set data: 19 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
3) Change the data of page: F, address: 15, and adjust so that the Y OUT signal level (A) becomes the specified value.
   Note: The data of address: 15 should be 70 to FF.
4) Press the PAUSE button of the adjusting remote commander.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.

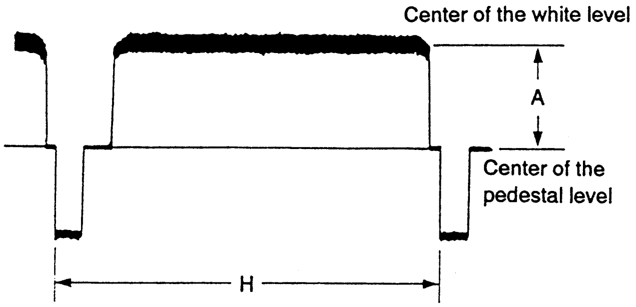


Fig. 7-1-15.

17. Auto White Balance Standard Data Input

Subject	White pattern standard picture frame
Adjustment Page	F
Adjustment Address	0C, 0D, 0E, 0F

Adjusting method:

1) Turn the power of the unit OFF/ON.
2) Page: 6, address: 00, data: 01
3) Check that the data of page: 6, address: 11 is 00.
4) Wait for 2 seconds.
5) Set data: 11 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
6) Set data: 0D to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
   (When the standard data is taken in, the data will be automatically input to addresses 0C to 0F of page F.)
7) Check that the data of page: 6, address: 11 is 01.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.

18. Auto White Balance Adjustment

Adjust to the proper auto white balance output data.
If it is not correct, auto white balance and color reproducibility will be poor.

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	Check with the DDS display on the EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	11 (NORM R) 12 (NORM B)
Specified Value	CCD-FX430/FX435/FX530 R ratio: 2A40 to 2AC0 B ratio: 5E00 to 5F00 CCD-FX630 R ratio: 2B40 to 2BC0 B ratio: 5E00 to 5F00

Adjusting method:

1) Place the C14 filter for color temperature correction on the lens.
2) Page: 1, address: 00, data: 01
3) Set data: 21 to page: D, address: 21, and press the PAUSE button of the adjusting remote commander.
4) Page: 6, address: 00, data: 01
5) Set data: D0 to page: F, address: 10, and press the PAUSE button of the adjusting remote commander.
6) Set data: 04 to page: 6, address: 02.
7) Change the data of page: F, address: 11, and adjust the average value of the DDS display data (the display data at the bottom right of the EVF or the TV monitor) to the R ratio specified value.
8) Press the PAUSE button of the adjusting remote commander.
9) Set data: 05 to page: 6, address: 02.
10) Change the data of page: F, address: 12, and adjust the average value of the DDS display data to the B ratio specified value.
11) Press the PAUSE button of the adjusting remote commander.

Processing after completing adjustments

1) Set data: 00 to page: F, address: 10, and press the PAUSE button of the adjusting remote commander.
2) Set data: 00 to page: D, address: 21, and press the PAUSE button of the adjusting remote commander.
3) Set data: 00 to page: 6, address: 02.
4) Page D protect mode setting.
   Page: 1, address: 00, data: 00

19. White Balance Check

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction ND filter 1.0 and 0.3
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Specified Value	Fig. 7-1-16. A to C

Checking method:

1) Check that the lens is not covered with either filter.
2) Page: 6, address: 00, data: 01
3) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
4) Check that the center of the white luminance point is within the circle shown in Fig. 7-1-16.A.
5) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
6) Set data: 23 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
7) Place the C14 filter on the lens.
8) Check that the center of the white luminance point settles in the circle shown in Fig. 7-1-16. B.
9) Remove the C14 filter, and place the ND filter 1.3 (1.0+0.3) on the lens.
10) Check that the center of the white luminance point settles in the circle shown in Fig. 7-1-16. C.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
2) Set data: 00 to page: 6, address: 00, and press the PAUSE button.

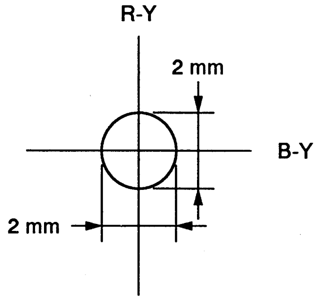


Fig. 7-1-16. A

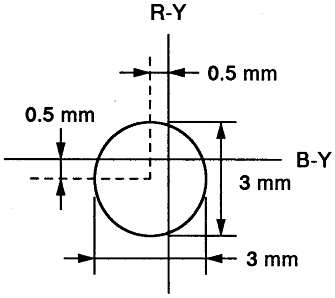


Fig. 7-1-16. B

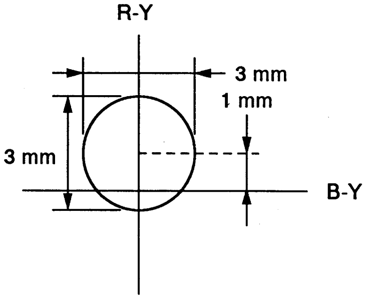


Fig. 7-1-16. C

20. VIDEO OUT Level Check

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal (Terminated at 75 Ω)
Measuring Instrument	Oscilloscope
Specified Value	Y level=660 ± 40 mV SYNC level=285 ± 20 mV BURST level=285 ± 30 mV

Checking method:

1) Check that the Y level, SYNC level and BURST level satisfy the specified values.

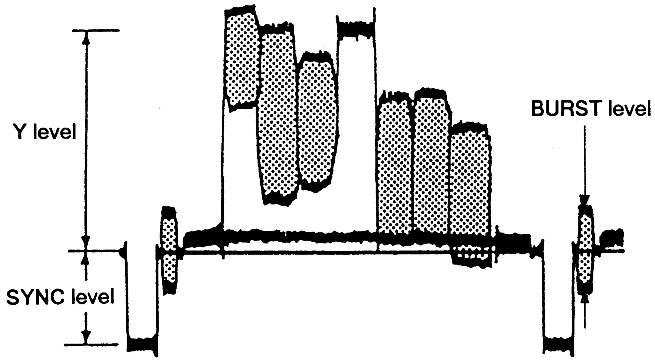


Fig. 7-1-17.

1-3. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT (VF-44 BOARD)

1-3-1. Horizontal Tilt Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Specified Value	See Fig. 7-1-19.

Adjustment method:

1) Adjust RV503 (BRIGHT) for appropriate brightness on CRT screen.
2) Loosen the DY (deflection yoke) tightening nut. (See Fig. 7-1-18.)
3) Make a picture horizontal by turning the DY.
4) Retighten the nut. (Do not tighten excessively.)

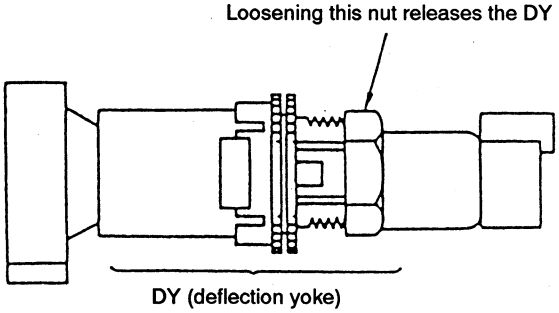
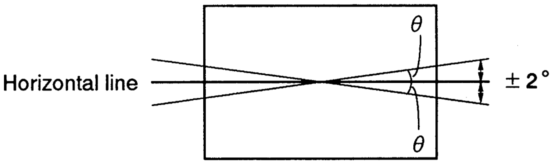


Fig. 7-1-18.



Specified value: Image orientation within ± 2° of horizontal line.

Fig. 7-1-19.

1-3-2. Centering Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Specified Value	See Fig. 7-1-21.

Adjustment method:

1) Turn the centering adjustment rings to provide an image with even right, left, upper and lower margins. (See Fig. 7-1-20.)

Note: Since the centering position is affected by the earth magnetism, turn the equipment over 360° horizontally, and make adjustments at the orientation which exhibits median displacements of the image.

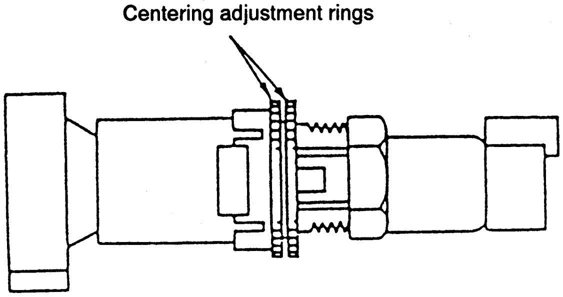
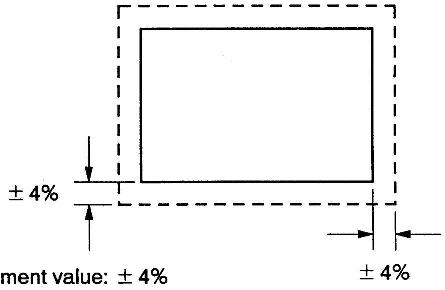


Fig. 7-1-20.



Adjustment value: ± 4%

Fig. 7-1-21.

1-3-3. Horizontal Amplitude Adjustment (VF-44 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Adjustment Element	C504
Specified Value	6 ± 3%

Adjustment method:

1) Line up the upper and lower sections of the monoscope image with the upper and lower edges of the screen by RV505 (V SIZE).
2) Rotate RV503 (BRIGHT) to set the brightness to the normal level.
3) Short or open the pattern $\boxed{A}$ of the H size adjustment capacitor (C504) to provide horizontal overscans of 6 ± 3% (total of left and right). (See Fig. 7-1-23.)

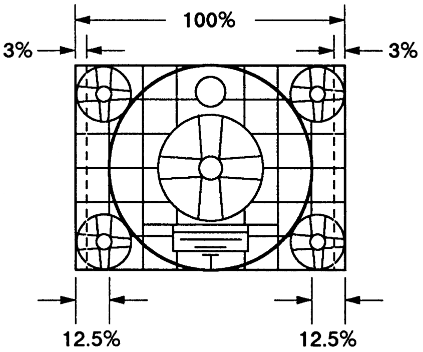
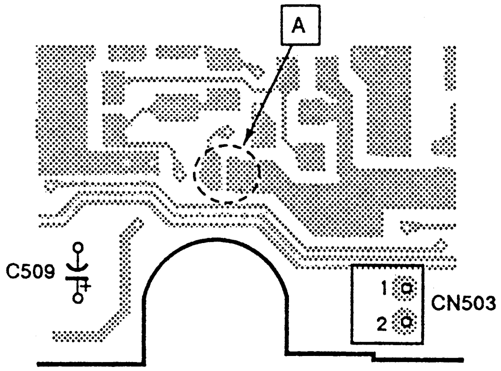


Fig. 7-1-22.



VF-44 BOARD (COMPONENT SIDE)

A section	H size
Short	Large
Open	Small

Fig. 7-1-23.

1-3-4. Vertical Amplitude Adjustment (VF-44 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Adjustment Element	RV505 (V SIZE)
Specified Value	5 ± 3%

Adjustment method:

1) By turning RV505 (V SIZE), adjust vertical overscan to 5 ± 3% (upper and lower total).

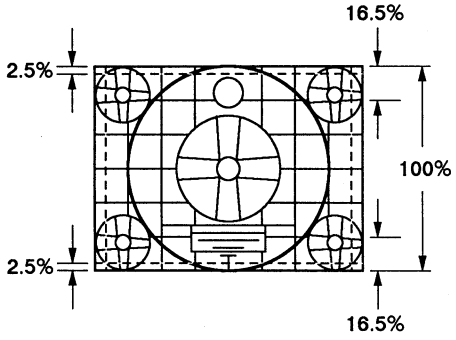


Fig. 7-1-24.

1-3-5. Focus Adjustment (VF-44 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Adjustment Element	RV502 (FOCUS)

Adjustment method:

1) Adjust to the best focus point with RV502.

1-3-6. Brightness, Contrast Adjustments (VF-44 Board)

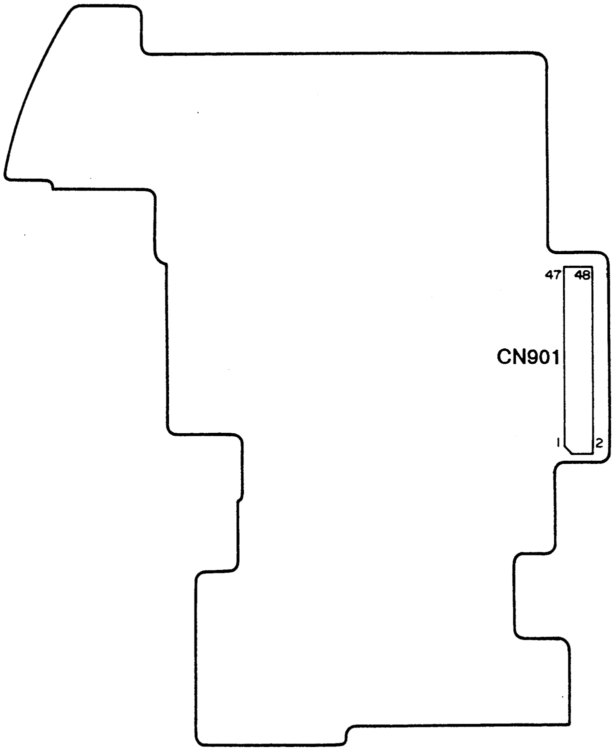
Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Adjustment Element	Brightness: RV503 (BRIGHT) Contrast: RV501 (CONT)

Adjustment method:

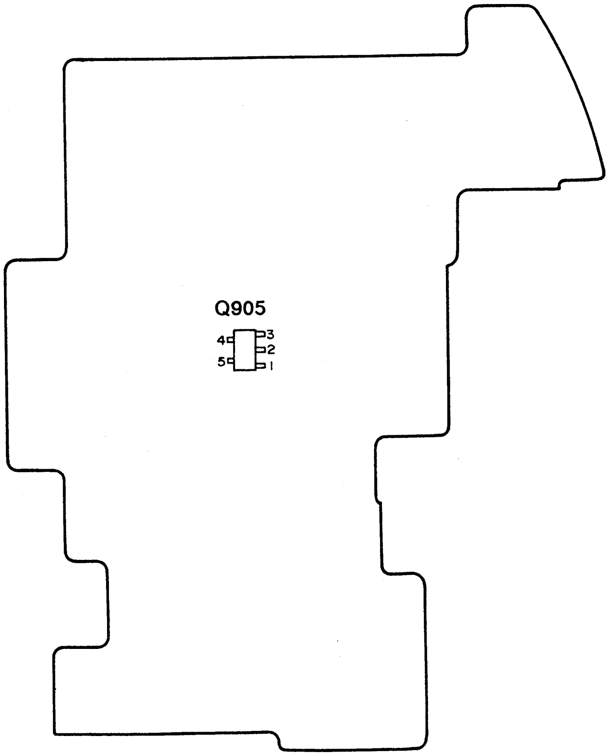
1) Adjust RV503 (BRIGHT) and RV501 (CONT) alternately until the bright and dark areas of a gray scale are displayed correctly. (The bright areas should not be made too bright to avoid a fuzzy display of the cross-hatches in the monoscope circle, and the brightness of the dark areas should be such that discrimination between the darkest and second darkest area is possible.)

1-4. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

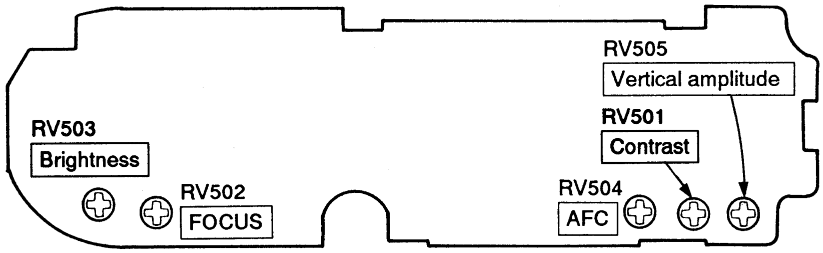
DD BOARD (COMPONENT SIDE)


47
48
CN901
1
2

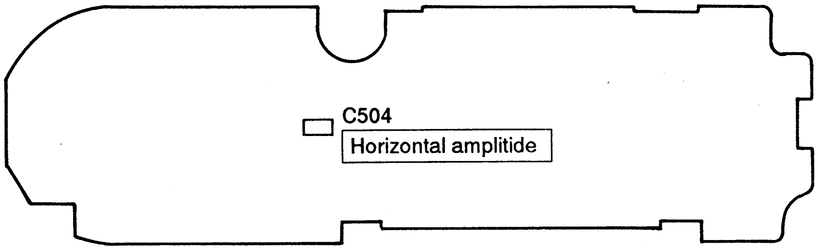
DD BOARD (CONDUCTOR SIDE)



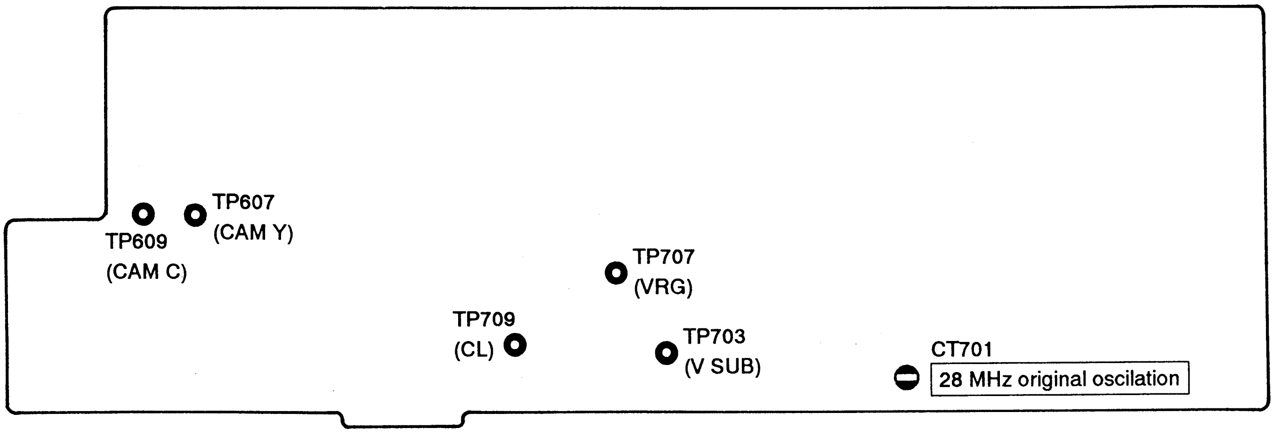
VF-44 BOARD (COMPONENT SIDE)


RV505
Vertical amplitude
RV501
Contrast
RV503
Brightness
RV502
FOCUS
RV504
AFC

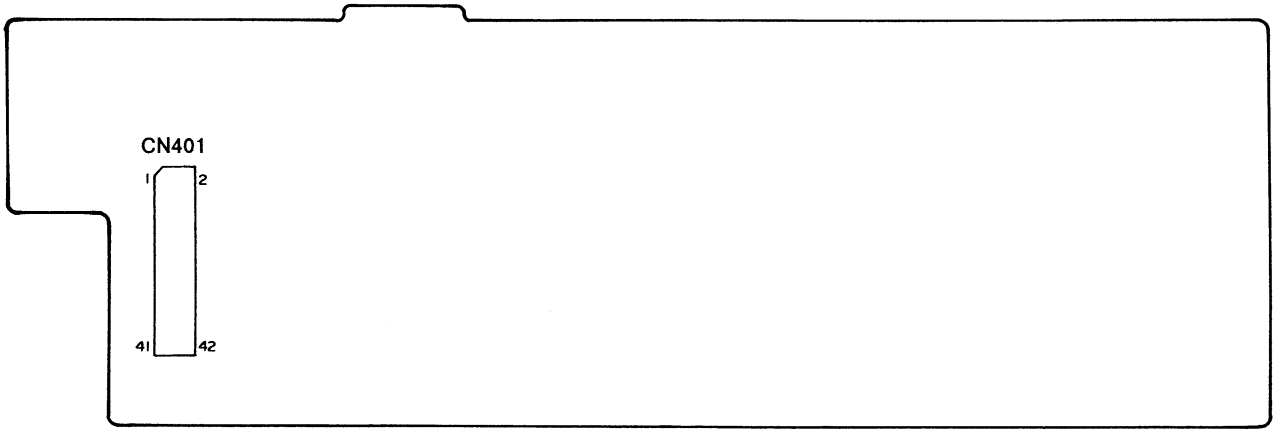
VF-44 BOARD (CONDUCTOR SIDE)


C504
Horizontal amplitide

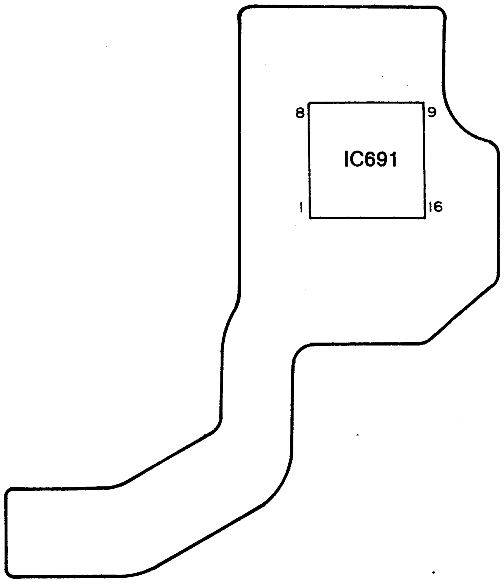
VC BOARD (COMPONENT SIDE)


TP607
(CAM Y)
TP609
(CAM C)
TP707
(VRG)
TP709
(CL)
TP703
(V SUB)
CT701
28 MHz original oscilation

VC BOARD (COMPONENT SIDE)


CN401
1
2
41
42

FP-46 BOARD


8
9
IC691
1
16

7-2. MECHANICAL SECTION ADJUSTMENTS

Mechanism Parts Adjustments

For details on the adjustments and checks of mechanical section and replacements of mechanism parts, refer to the separate volume-"8 mm Video Mechanism Adjustment Manual Ⅳ A Mechanism".

2-1. OPERATING WITHOUT A CASSETTE

1) Refer to "2. DISASSEMBLY" and supply the power with the cabinet removed. (So that the mechanical deck can be operated.)
2) Connect the adjusting remote commander to the remote terminal.
3) Turn on the HOLD switch of the adjusting remote commander.
4) Close the cassette compartment without loading a cassette and complete loading.
5) Set data: 01 to page: 1, address: 00.
   (Release of the protect)
6) Set data: 01 to page: D, address: 02, and press the PAUSE button of the adjusting remote commander.
   (Emergency prohibition mode setting)
7) Set data: 04 to page: D, address: 03, and press the PAUSE button of the adjusting remote commander.
   (Sensor ineffective mode setting)

By carrying out the above procedure, the unit can be operated without loading a cassette.
Be sure to carry out "Processing after Operations" after checking the operations.
Set the data of page: D, address: 03 to the following if the sensor ineffective mode, forced VTR power supply ON mode or forced camera power supply ON mode are to be used together.

Forced VTR power supply ON mode········· 06
Forced camera power supply ON mode······ 05

[Processing after Operations]

1) Set data: 01 to page: 1, address: 00.
   (Release of protect)
2) Set data: 00 to page D, address: 02, and press the PAUSE button of the adjusting remote commander.
   (Release of the emergency prohibition mode)
3) Set data: 00 to page: D, address: 03, and press the PAUSE button of the adjusting remote commander.
   (Release of the sensor ineffective mode)
4) Set data: 00 to page: 1, address: 00.
   (Protect setting)
5) Disconnect the power supply of the unit.

2-2. TAPE PATH ADJUSTMENT

1. Preparations for adjustments

1) Clean the tape path face (tape guide, drum, capstan shaft, pinch roller).
2) Connect the adjusting remote commander to the remote terminal.
3) Turn on the HOLD switch of the adjusting remote commander.
4) Select page: 1, address: 00, and set data: 01.
   (Release of the protect)
5) Select page: D, address: 02, and set data: 03.
   (Set the track shift mode. The adjusting remote commander can be disconnected if its PAUSE button of remote commander is pressed. In this case, be sure to perform "Processing after operations" after completing adjustments.)
6) Connect the oscilloscope.
   Channel 1-Pin ③ of CN102 of VS board
   External trigger-Pin ④ of CN102 of VS board
   (Connect the oscilloscope via the measuring pin tool for the video section (J-6082-140-A).)
7) Playback the alignment tape (WR5-1NP) for tracking.
8) Check that the RF waveform of the oscilloscope is flat at both the entrance and the exit.
   If not flat, perform necessary adjustment according to the separate 8 mm Video Mechanical Adjustment Manual IV (A Mechanism).
9) Perform "Processing after operations", after completing adjustments.

CN102 of VS board

1	PB ´CH RF
2	PB PCM RF
3	PB RF
4	RF SWP
5	RP GND
6	REC 2

[Processing after operations]

1) Connect the adjusting remote commander, and turn on the HOLD switch.
2) Select page: 1, address: 00, and set data: 01.
3) Select page: D, address: 02, and set data: 00.
4) Press the PAUSE button of the adjusting remote commander.
5) Remove the power supply from the unit.

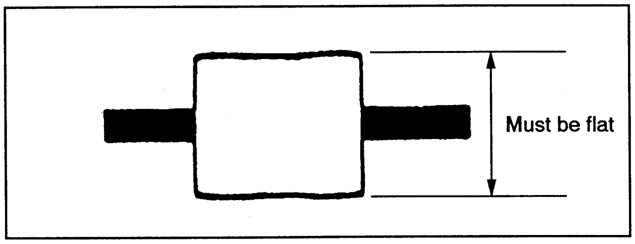


Fig. 7-2-1.

7-3. VIDEO SECTION ADJUSTMENTS

When performing adjustments, refer to the layout diagrams for adjustment related parts beginning from page 7–68.

3-1. PREPARATIONS BEFORE ADJUSTMENT

The following adjusting instruments are used for adjusting the video section.

3-1-1. Equipments to be Used

1) TV monitor
2) Oscilloscope: 2 phenomena, band 30 MHz or wider, with delay mode. (Use a 10:1 probe unless specified otherwise.)
3) Frequency counter
4) Pattern generator with video output terminal
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuater
10) Regulated power supply
11) Alignment tape
    For tracking adjustment (WR5-1NP)
    Part Code: 8-967-995-02
    For video frequency characteristics adjustment (WR5-6N)
    Part Code: 8-967-995-12
    For checking operations
    (WR5-4NL)$^{\text{Note 1}}$
    Part Code: 8-967-995-51
    (WR5-5NSP)$^{\text{Note 2}}$
    Part Code: 8-967-995-42
    Note: The following alignment tapes can also be used.
    1) WR5-3NL (8-967-995-31)
    2) WR5-4NSP (8-967-995-41)
    For checking AFM stereo operations (WR5-9NS)
    Part Code: 8-967-995-23
12) Remote commander for adjustment (J-6082-053-A)
13) VC board extension cord (42P, 0.8 mm)
    Part Code: J-6082-285-A
14) Control switch block (FK board) extension cord (9P, 0.8 mm)
    Part Code: J-6082-288-A
15) Control switch block (CK board) extension cord (18P, 0.8 mm)
    Part Code: J-6082-289-A
16) AU-168 board extension cord (34P, 0.8 mm) (CCD-FX530)
    Part Code: J-6082-286-A

3-1-2. Adjusting Precautions

1) The adjustment for this unit is performed using the VIDEO input (VIDEO terminal input) or the camera input. The camera input can be used for video adjustments only. Use the VIDEO input for the other adjustments.
    When using the VIDEO input, set the power supply switch to "PLAYER" or set the "forcible VTR power supply ON mode" using the adjusting remote commander. (Note 1).
    When using the camera input, set the power supply switch to "CAMERA" or set the "Forcible camera+VTR power supply ON mode" using the adjusting remote commander (Note 2).
    After completing adjustments, be sure to exit the "forcible VTR power supply ON mode" or "forcible camera+VTR power supply ON mode" (Note 3).
2) The F panel block (MA board) is not used for video adjustments. Disconnect the following connectors in these adjustments.
    1. CN402 of the AU-157 board (CCD-FX430/FX435/FX630)
       CN1301 of the AU-168 board (CCD-FX530)
3) The view finder (VF board) is not used for video adjustments. Disconnect the following connector in these adjustments.
    1. CN206 of the VS board (4P, 0.5 mm)
4) The cabinet (R) (CK board: Power supply switch, camera function switch) need not be connected if the "forcible VTR power supply ON mode" or "forcible camera+VTR power supply ON mode" is set. In this case, disconnect the following connectors.
    1. CN503 of the VS board (18P, 0.8 mm)
    2. CN101 of the BZ board (4P, 0.8 mm)
    However, as disconnecting these connectors means disconnecting the 3V lithium power supply, data set by the user such as the date, time, and menu will be lost. After completing the adjustments, set these data again, and be sure to exit the "forcible VTR power supply ON mode" or "forcible camera+VTR power supply ON mode". (Note 3)
    When connecting the cabinet (R) using the extension cord, use the following type.
    1. J-6080-289-A (18P, 0.8 mm)

5) The lens block and VC board are not used for video adjustments. Disconnect the following connectors in these adjustments.
   1. CN203 of the VS board (42P, 0.8 mm)
   2. CN775 of the VS board (8P, 0.8 mm) (CCD-FX630)

   Connect the following when removing the VC board.
   1. Connect Pin ㉒ (REG H) and Pin ⑦ (D3.6V) of CN203 of the VS board with a jumper wire.

   When connecting the VC board using the extension cord, use the following type.
   1. J-6080-285-A (42P, 0.8 mm)
6) The audio board (AU board) is required only for audio adjustments. When not using it, disconnect the following connector.
   1. CN202 of the VS board

   When connecting the AU-168 board (CCD-FX530) using the extension cord, use the following type.
   1. J-6080-286-A (34P, 0.8 mm)
7) When opening the VS board, disconnect the following connectors.
   1. CN502 of the VS board (9P, 0.8 mm)

   The VTR function keys will not work. Use the remote commander to perform operations other than EJECT.

   When connecting the FK board and CN502 of VS board using the extension cord, use the following type.
   1. J-6080-288-A (9P, 0.8 mm)

Note 1: Setting the "forcible VTR power supply ON mode (VIDEO input mode)"
1) Set data: 01 to page: 1, address: 00.
   (Releasing the page D protect)
2) Set data: 02 to page: D, address: 03 and press the PAUSE button of the adjusting remote commander.
   (Setting the forcible VTR power supply ON mode)

By performing the above, the VTR can be operated with the cabinet (top) removed. After completing adjustments, be sure to exit the "forcible power supply ON mode".

Note 2: Setting the "forcible camera+VTR power supply ON mode (camera input mode)"
1) Set data: 01 to page: 1, address: 00.
   (Releasing the page D protect)
2) Set data: 03 to page: D, address: 03 and press the PAUSE button of the adjusting remote commander.
   (Setting the forcible camera+VTR power supply ON mode)

By performing the above, the VTR can be operated with the cabinet (top) removed. After completing adjustments, be sure to exit the "forcible power supply ON mode".

Note 3: Exiting the "forcible power supply ON mode"
1) Set data: 01 to page: 1, address: 00.
   (Releasing the page D protect)
2) Set data: 00 to page: D, address: 03 and press the PAUSE button of the adjusting remote commander.
   (Setting the forcible power supply ON mode)
3) Set data: 00 to page: 1, address: 00.
   (Setting the page D protect)

3-1-3. Connecting the Equipments

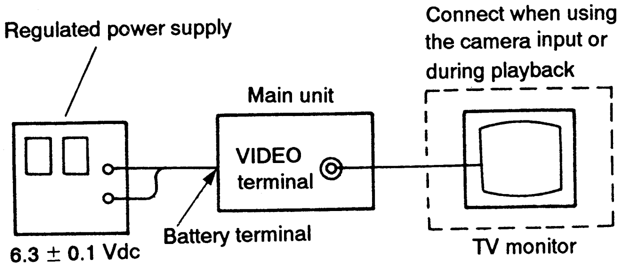
Connect the measuring instruments as shown in Fig. 7-3-1. according to the input terminal specifications (VIDEO input or CAMERA input), and perform the adjustments.

The input terminal is specified in the ( ) in the signal column. Either input terminal can be used when there are no specifications.

Note 1: If the VIDEO input is used for the adjustments which specify for the CAMERA input to be used, the product specifications of the unit may not be satisfied in some cases. Be sure to perform according to the specifications.

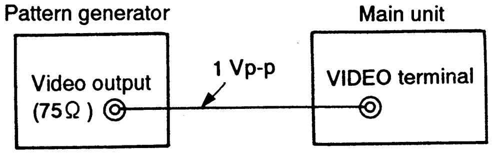
Note 2: When adjustments are performed with the S video output terminal VTR as the signal source, the efficiencies of the unit may be affected by VTR. It is recommendet that a pattern generator with a Y/C separation output terminal be used as much as possible.

Connecting the TV monitor and regulated power supply


Regulated power supply
Connect when using the camera input or during playback
Main unit
VIDEO terminal
6.3 ± 0.1 Vdc
Battery terminal
TV monitor

Connecting the pattern generator

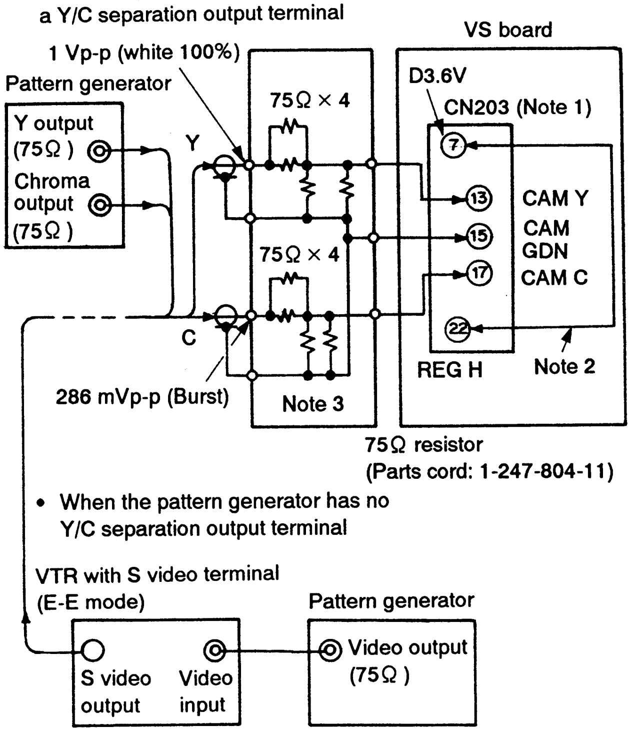
[VIDEO Input]
Set the power supply switch to "PLAYER" or set the "forcible VTR power supply ON mode" using the adjusting remote commander.


Pattern generator
Main unit
Video output (75Ω)
1 Vp-p
VIDEO terminal

Note: The TV monitor cannot be connected.
Use the view finder to monitor.

[CAMERA Input]
Set the power supply switch to "CAMERA" or set the "forcible camera+VTR power supply ON mode" using the adjusting remote commander.

- When the pattern generator has a Y/C separation output terminal


VS board
1 Vp-p (white 100%)
Pattern generator
Y output (75Ω)
Chroma output (75Ω)
Y
75Ω × 4
75Ω × 4
D3.6V
CN203 (Note 1)
⑦
⑬
⑮
⑰
㉒
CAM Y
CAM GDN
CAM C
REG H
Note 2
C
286 mVp-p (Burst)
Note 3
VTR with S video terminal (E-E mode)
Pattern generator
S video output
Video input
Video output (75Ω)

75Ω resistor
(Parts cord: 1-247-804-11)

- When the pattern generator has no Y/C separation output terminal

Note 1: Remove the VC board.
Note 2: Connect Pins ⑦ and ㉒ of CN203 with the jumper wire.
Note 3: The chroma signal input is not required for some adjustments.

Fig. 7-3-1.

3-1-4. How to Set the REC Mode

1) REC key forbidden accept mode cancel
   1. Connect the adjusting remote commander to the remote terminal.
   2. Turn on the power.
   3. Turn on the HOLD switch of the adjusting remote commander.
   4. Select the page: 1 address: 00, and set the data to 01. (Protect mode cancel)
   5. Select the page: D address: 17, and set the data to 12. (REC key forbidden accept mode cancel)
   6. Press PAUSE button on the adjusting remote commander. (Write to the non-volatile memory)

The REC key is accepted through the above procedure.

2) REC mode setting
   1. Turn off the HOLD switch of the adjusting remote commander.
   2. Press REC buttons of the adjusting remote commander.
   3. Perform "3. Procedure after completed the adjustment", after completing adjustment.

3) Procedure after completed the adjustment
   Be sure to return the mode to REC key forbidden accept mode after adjustment.
   1. Connect the adjusting remoter controller.
   2. Turn on the power.
   3. Turn on HOLD switch of the adjusting remote commander.
   4. Select the page: 1 address: 00, and set the data to 01. (Protect mode cancel)
   5. Select the page: D address: 17, and set the data to 02. (Setting of the REC key forbidden accept mode)
   6. Press PAUSE button on the adjusting remote commander. (Write to the non-volatile memory)
   7. Turn off the power.

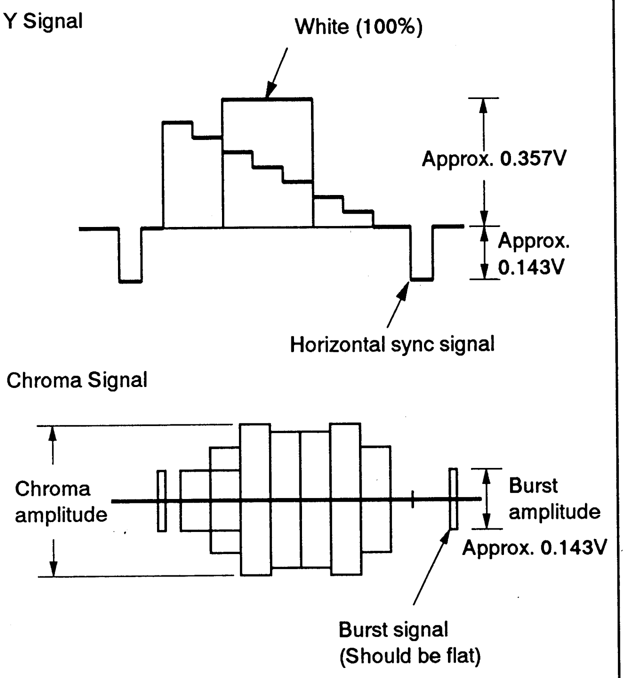
3-1-5. Checking the Input Signals

Because the video signal obtained from the pattern generator is used as the adjustment signal for adjusting the VTR section, the video output signal must satisfy the given specifications.

1. CAMERA Input

Connect the oscilloscope to Pin ⑬ of CN203 on VS board, and check that the sync signal of the Y signal is approximately 0.143 Vp-p and that the amplitude of the video section is approximately 0.357 Vp-p. (When a VTR with the S VIDEO output terminal is used, also check that the chroma signal and burst signal have not remained.) Connect the oscilloscope to Pin ⑰ of CN203 on VS board, and check that the burst signal amplitude of the chroma signal is approximately 0.143 Vp-p and flat, and that the amplitude ratio of the burst signal to the chroma signal is 0.30 : 0.66. The Y and chroma signals used in the adjustment are shown in Fig. 7-3-2.

Note: Be sure to check in the recording mode.


Y Signal
White (100%)
Approx. 0.357V
Approx. 0.143V
Horizontal sync signal
Chroma Signal
Chroma amplitude
Burst amplitude
Approx. 0.143V
Burst signal
(Should be flat)

Burst amplitude: Chroma amplitude=0.30:0.66

Fig. 7-3-2. Color bar signal of pattern generator

2. VIDEO Input

Connect the oscilloscope to the video terminal, and check that the sync signal amplitude of the video signal is approximately 0.286V, the amplitude of the video section is approximately 0.714V, the amplitude of the burst signal is approximately 0.286V and flat, and that the level ratio of the burst signal to the "red" signal is 0.30 : 0.66.

The video signal (color bar) used for adjusting the VTR section is shown in Fig. 7-3-3.

Note: Be sure to check in the record mode.

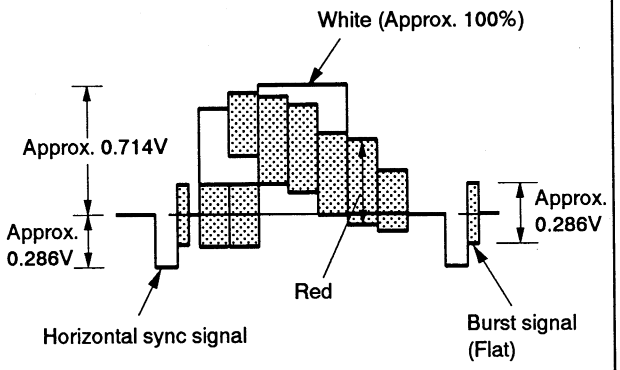

White (Approx. 100%)
Approx. 0.714V
Approx. 0.286V
Approx. 0.286V
Red
Horizontal sync signal
Burst signal
(Flat)

Fig. 7-3-3. Color Bar Signal of Pattern Generator

3-1-6. Alignment Tape

The following table lists alignment tapes which are available. Use the tape specified in the signal column for each adjustment. If the type of tape to be used for checking operations is not specified, use whichever type.

Name	**Record-ing mode**	**Tape type**	**Tape speed**	**Recording contents**		**Usage**
				Video area	**PCM area**	
Tracking WR5-1NP	L	MP	SP	CH2: Signal for 1 MHz tape path adjustment		Tape path adjustment Switching position adjustment
Video frequency characteristics WR5-6N	L	MP	SP	RF sweep 0 to 10 MHz Marker 1, 3.58, 5.5, 7 MHz		Frequency characteristics adjustment
Operation check (SP mode) WR5-5NSP	L	MP	SP	• Video signal Color bar 4 minutes Monoscope 4 minutes • Audio signal (AFM) 400 Hz 60% modulation	• Audio signal (PCM) Monoscope section 20 Hz 20 sec. 400 Hz 20 sec. 14 kHz 20 sec. } Color bar section Repeated 4 times 1 kHz 4 minutes	Checking operations
Operation check (LP mode) WR5-4NL	L	MP	LP	• Video signal Color bar 4 minutes Monoscope 4 minutes • Audio signal (AFM) 400 Hz 60% modulation		
AFM stereo Operation check WR5-9NS	L	MP	SP	• Video signal Color bar 4 mins. Monoscope 4 mins. • Audio signal (AFM) Stereo section (color bar) Lch: 400 Hz, Rch: 1 kHz (L+R: 1.5 MHz±60 kHz DEV L–R: 1.7 MHz±30 kHz DEV) Bilingual section (Monoscope) MAIN: 400 Hz (1.5 MHz ± 60 kHz DEV) SUB: 1 kHz (1.7 MHz ± 30 kHz DEV)	• Audio signal (PCM) 400 Hz 8 mins.	AFM stereo Checking operations

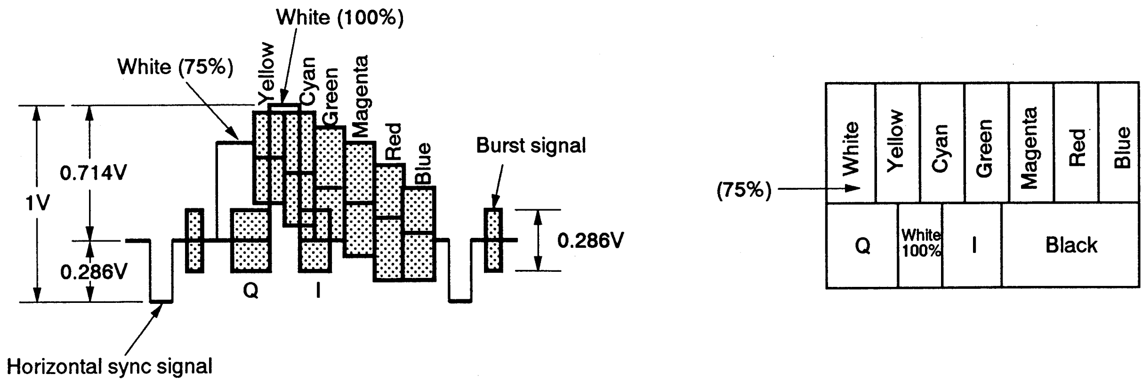
Note: Recording mode
L ··············· Conventional mode
E ··············· hi8 (hi band) mode

Tape type
MP············· Particle type metal tape
ME············· Evaporated type metal tape

Table 7-3-1.

Fig. 7-3-4. shows the 75% color bar signals recorded on the alignment tape.

Note: Measure using the video output terminal (Terminated at 75 Ω)


White (100%)
White (75%)
Yellow
Cyan
Green
Magenta
Red
Blue
Burst signal
0.714V
1V
0.286V
Q
I
0.286V
Horizontal sync signal
(75%)
White
Yellow
Cyan
Green
Magenta
Red
Blue
Q
White 100%
I
Black

Color bar signal waveform

Color Bar Pattern

Fig. 7-3-4. Color Bar Signals of the Alignment Tape

3-1-7. Output Level and Impedance

AV output	Mini jack
Video output	Phono-jack, 1 Vp-p, 75Ω , unbalanced, sync negative
Audio output	Phono-jack, –7.5 dBs, (at load impedance 47 kΩ) impedance less than 2.2 kΩ

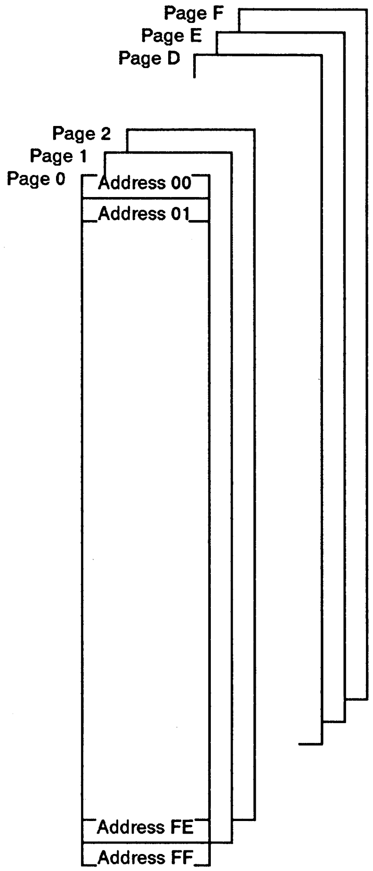
3-1-8. Service Mode

1. Setting the service mode

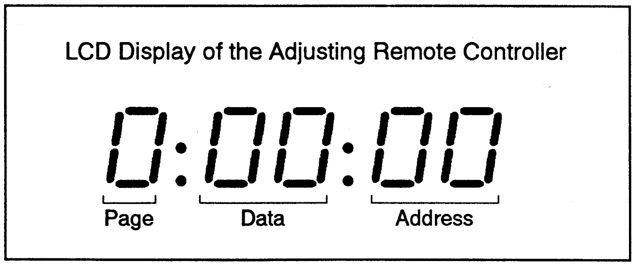
The service mode consists of the adjustment mode which adjusts the EVR and the test mode which shows the condition of the unit.

The unit can be set into the test mode and adjustment mode by connecting the adjusting remote commander (Set the HOLD switch to "HOLD").

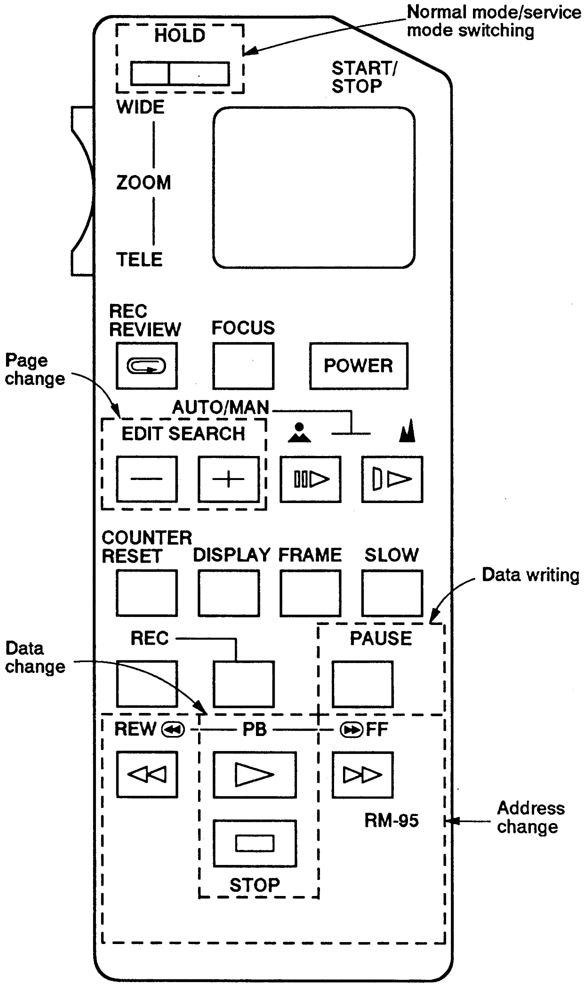
(1) Service LANC memory map


Page F
Page E
Page D
Page 2
Page 1
Page 0
Address 00
Address 01
Address FE
Address FF

Page	Page Layout
0	
1	D page write protect setting/release
2	Mode controller RAM, I/O
3	Mechanism controller RAM, I/O
4	
5	
6	Shared by camera section
7	Camera controller RAM, I/O
8	
9	
A	2 bytes data display
B	
C	
D	VTR EEPROM (Note 1)
E	
F	Camera EEPROM (Note 2)


LCD Display of the Adjusting Remote Controller
0:00:00
Page
Data
Address

Adjusting remote commander RM-95 (J-6082-053-A)


Normal mode/service mode switching
HOLD
START/ STOP
WIDE
ZOOM
TELE
REC REVIEW
FOCUS
POWER
Page change
AUTO/MAN
EDIT SEARCH
—
+
COUNTER RESET
DISPLAY
FRAME
SLOW
Data writing
REC
PAUSE
Data change
REW
PB
FF
RM-95
Address change
STOP

Note 1: The data of this page is written in the EEPROM (IC501 of VS board).

Note 2: The data of this page is written in the EEPROM (IC601 of VC board).

(2) Category codes

This unit uses category codes for pages 2 and 3.

(Example)

Specification of	Page 2	Category 01	Address 47

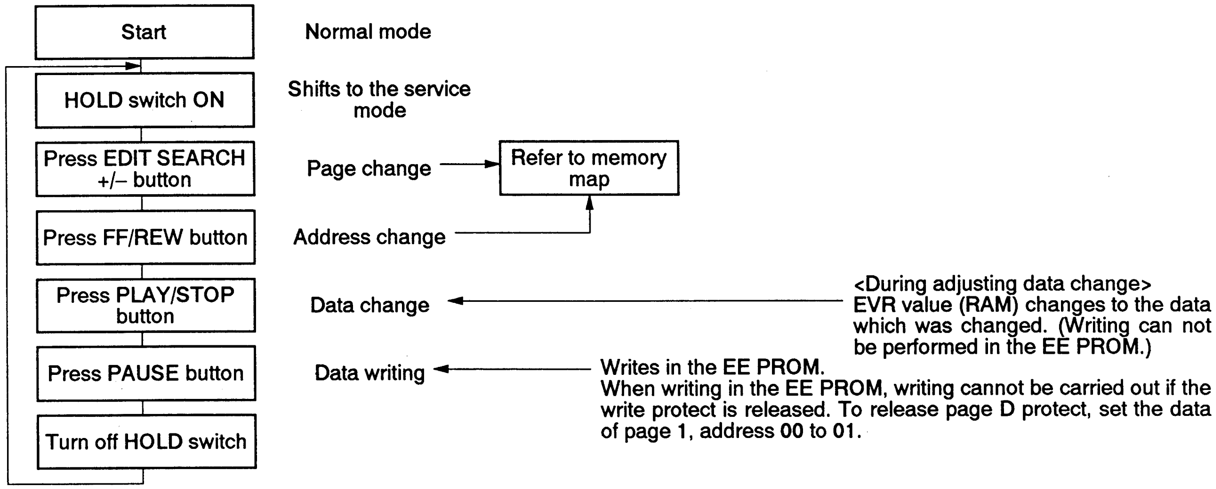
Page 2 is the mode controller

Page 3 is the mechanism controller

The actual category and address are specified by the adjusting remote commander as follows.

Order	Page	Address	Data	Procedure
1	2	00	01	Select category 01 using the data of page 2, address 00. From here onwards, category 01 will be selected at page 2 until the data of page 2, address 01 is rewritten.
2	2	47		As the data of page 2, address 00 is 01, select page 2, address 47 to select page 2, category 01, address 47. (The data of this address is the battery voltage A/D conversion value of the mode controller input.)

[Shifting to the service mode using the adjusting remote commander]


Start
Normal mode
HOLD switch ON
Shifts to the service mode
Press EDIT SEARCH +/– button
Page change
Refer to memory map
Press FF/REW button
Address change
Press PLAY/STOP button
Data change
Press PAUSE button
Data writing
Turn off HOLD switch

<During adjusting data change>
EVR value (RAM) changes to the data which was changed. (Writing can not be performed in the EE PROM.)

Writes in the EE PROM.
When writing in the EE PROM, writing cannot be carried out if the write protect is released. To release page D protect, set the data of page 1, address 00 to 01.

Command Name	Command Function	Normal LANC Command
Page Up	Page+1	Edit Search+
Page Down	Page–1	Edit Search –
Direct Page Set	Sets to the specified page	Event Clear
Address Up	Address+1	Fast Forward
Address Down	Address–1	Rewind
Data Up	Data+1	Play Back
Data Down	Data–1	Stop
Store	Writes data in the EEPROM, RAM	Pause

(3) Additional note on adjustment

After the completion of the all adjustments, cancell the adjustment mode by either of the following ways.

1) Unplug the main power supply and remove the lithium battery. (In this case, date and time and menu setting have been set by users are canceled. Perform resetting.)
2) Return data of the address: 00 on page: 1 to 00. And when data on page: 2 is changed, return the data to the original condition.

2. Page D write protect

Release/set the page D write protect.

Page 1	Address 00

Data	Function
00	Normal (Write protect condition)
01	Release the write protect

3. Test mode setting

Set/release each test mode. Release the protect (Page: 1, Address: 00, Data: 01) before setting the data.

Page D	Address 02

Data	Function
00	Normal
01	Test mode 1 Various emergency prohibitions and releases Drum, capstan, loading motor, reel, tape top and end, DEW SP/LP automatic discrimination prohibition, manual switching, 5 minutes pause release prohibition Power off prohibition/release by battery end
02	Test mode 2 Not used
03	Test mode 3 Track shift Performs the track shift playback Rear lock distinction prohibition during PB SP/LP automatic discrimination prohibition, manual switching
04	Test mode 4 Rear lock mode Performs rear lock playback SP/LP automatic discrimination prohibition, manual switching

※ For page D, the data set will be recorded in the nonvolatile memory by pressing the PAUSE button on the adjusting remote commander. Take note that, in this case, the test mode will not be released even if the main power has been turned off (6.3 Vdc).

※ Be sure to return this address data to 00 after completing adjustments/repairs and press the PAUSE button of the adjusting remote commander.

4. Emergency code

Fault (error) symptoms can be checked.

Page D	Address E4

Last emergency code
……Last error code generated (This data will be renewed each time an error occurs.)

Page D	Address E8

2nd emergency code
……2nd error code generated

Page D	Address EC

First emergency code
……First error code generated

※ Be sure to rewrite the data of addresses E4, E8 and EC to 00 after repairs/adjustments.

※ When rewriting the data, be sure to press the PAUSE button of the remote commander after setting the data.

Code	Error Condition
00	No error
01	Loading motor error
02	Reel error during unloading
03	Reel errors at other times
04	Capstan error
05	FG error during drum start up
06	PG error during drum start up
07	FG error during normal drum conditions
08	PG error during normal drum conditions
09	Phase error during normal drum conditions

5. Emergency mode

The operation mode can be checked during faults.

Page D	Address E5

Last emergency mode
……The operation mode when the last error is generated
(This data will be renewed each time an error occurs.)

Page D	Address E9

2nd emergency mode
……The operation mode when the 2nd error is generated

Page D	Address ED

First emergency mode
……The operation mode when the first error is generated

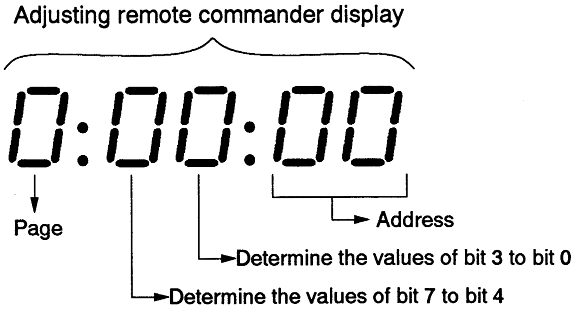
※ Be sure to rewrite the data of addresses E5, E9 and ED to 00 after repairs/adjustments.

※ When rewriting the data, be sure to press the PAUSE button of the adjusting remote commander after setting the data.

Code	Error Conditions
00	BEFOR INITIALIZE
01	EJECTED
02	NORMAL STOP
03	FF
04	NORMAL REC
06	NORMAL PB
07	PB PAUSE
12	LOADING
14	REC PAUSE
26	X1
27	1/5 SLOW
31	UNLOADING
46	CUE
56	REVIEW
62	STOP TAPE END
66	X2
67	FRAME
72	STOP TAPE TOP
83	REWIND
85	REC REVIEW (+)
95	REC REVIEW (–)
97	–PB PAUSE
A2	EMERGENCY LOADING
A5	EDIT SEARCH (+)
B1	EMERGENCY UNLOADING
B2	STOP EMERGENCY 1
B5	EDIT SEARCH (–)
C2	STOP EMERGENCY 2
E2	STOP NO CASSETTE
F5	EDIT PAUSE

6. Bit value discrimination

Bit values must be discriminated using the display data of the adjusting remote commander for the following items. Use the table below to discriminate if the bit value is "1" or "0".


Adjusting remote commander display
0:00:00
Page
Address
Determine the values of bit 3 to bit 0
Determine the values of bit 7 to bit 4

	Remote controller display	Bit value			
		bit 3 or bit 7	bit 2 or bit 6	bit 1 or bit 5	bit 0 or bit 4
	0	0	0	0	0
	1	0	0	0	1
	2	0	0	1	0
	3	0	0	1	1
	4	0	1	0	0
	5	0	1	0	1
	6	0	1	1	0
	7	0	1	1	1
Ⓐ→	8	1	0	0	0
	9	1	0	0	1
	A(A)	1	0	1	0
	B(b)	1	0	1	1
	C(c)	1	1	0	0
	D(d)	1	1	0	1
Ⓑ→	E(E)	1	1	1	0
	F(F)	1	1	1	1

(Example) If the remote commander display data is "8E", bit values from bit7 to bit4 can be discriminated from column Ⓐ, and those from bit3 to bit0 from column Ⓑ.

7. Battery voltage check

Page 2	Category 01	Address 47

Display Data	Battery Voltage
F0	Approx. 10.6 Vdc
E0	Approx. 9.9 Vdc
D0	Approx. 9.2 Vdc
C0	Approx. 8.5 Vdc
B0	Approx. 7.8 Vdc
A0	Approx. 7.1 Vdc
90	Approx. 6.4 Vdc
80	Approx. 5.7 Vdc
70	Approx. 5.0 Vdc

Using method:

Order	Page	Address	Data	Procedure
1	2	00	01	Specification of category 01
2	2	47		The battery voltage can be discriminated by the display data.

※ Voltage measurement accuracy is approx. ± 10%.

8. Mechanism controller input/output check

Page 2	Category 00	Address 83

Bit	IN/OUT Signal	Condition
0		
1	E/L DET	“1”=Hi8, “0”=Normal
2	SP/LP DET	“1”=SP, “0”=LP
3	CLOG DET	“1”=Clog detected, “0”=Others
4	REC PROOF	“1”=Recording prohibited, “0”=Recording possible
5	TAPE PREEND	“1”=Tape preend, “0”=Others
6	DEW DET	“0”=Condensation occured, “1”=Others
7	CASSETTE IN	“0”=No cassette

Using method:

Order	Page	Address	Data	Procedure
1	2	00	00	Specification of category 00
2	2	83		The condition of each input signal can be discriminated by differentiating the bit value of the display data.

Page 2	Category 00	Address 84

Bit	IN/OUT Signal	Condition
0	VA PB MODE	“1”=PB, “0”=REC
1	RP PB MODE	“1”=PB, “0”=REC
2	JOG	“1”=Variable speed playback, “0”=Others
3	ME/MP SW	“1”=ME tape, “0”=Other tape
4	Hi8 MP SW	“1”=Hi8 MP tape, “0”=Other tape
5	SERVO OPERATION	“1”=SP mode, “0”=LP mode
6	VIDEO MUTE	“1”=Mute, “0”=Video output
7	AUDIO MUTE	“1”=Mute, “0”=Audio output

Using method:

Order	Page	Address	Data	Procedure
1	2	00	00	Specification of category 00
2	2	84		The condition of each signal can be discriminated by differentiating the bit value of the display data.

9. Mode switch and CC DOWN switch check

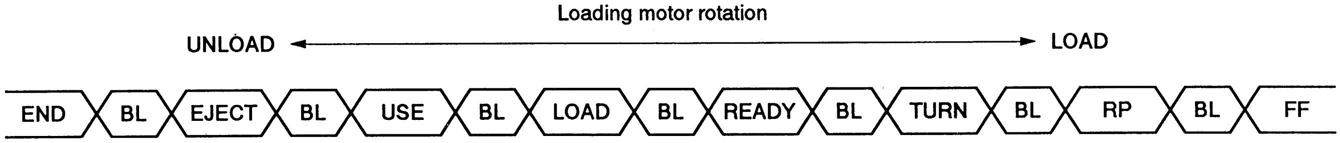
The mode switch position (mechanical section condition) can be checked.

Page 3	Category 00	Address E9

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
MSW 2	MSW 1	MSW 0	CC DOWN				

				DATA	POSITION	FUNCTION
0	0	0	0/1	E*/F*	BL	Interval of each position
0	1	1	1	7*	END	FULL END processing (T side lock removal)
0	0	1	1	3*	EJECT	Cassette compartment ejection
1	0	1	1	B*	USE	EJECTED (Unskate end)
0	0	1	0	2*	LOAD	LOADING (Skate in)
1	0	0	0	8*	READY	NORMAL STOP position
1	1	0	0	C*	TURN	OFF of pinch roller only with STOP↔FF/REW (oscillating position)
0	1	0	0	4*	RP	PB, REC, RVS, REV, CUE
0	0	0	0	0*	FF	FF/REW

*: Don't care


Loading motor rotation
UNLOAD
LOAD
END
BL
EJECT
BL
USE
BL
LOAD
BL
READY
BL
TURN
BL
RP
BL
FF

Using method:

Order	Page	Address	Data	Procedure
1	3	00	00	Specification of category 00
2	3	E9		The mode switch position and CC DOWN switch condition can be discriminated by the display data.

10. Tape top/end sensor check

Page 3	Category 02	Address 0A

Display Data	Tape Top/End Sensor Condition
00	Tape present (Middle of tape)
01	Tape end
10	Tape top
11	No tape

Tape end sensor condition
Tape top sensor condition

"0"=Non active (Not receiving light)
"1"=Active (Receiving light)

Using method:

Order	Page	Address	Data	Procedure
1	3	00	02	Specification of category 02
2	3	0E	10	Request for tape top/end sampling operations
3	3	0A		The condition of the tape top/end sensor can be discriminated by the display data.

11. Version of mechanical control microprocessor

Page 3	Category 02	Address 0B

Display Data	Microprocessor version
01	Version 1

Using method:

Order	Page	Address	Data	Procedure
1	3	00	02	Specification of category 02
2	3	0B		The microprocessor version can be discriminated by the display data.

12. Page D address list

Note 1: The adjustment data initial value is the data input before performing video section adjustments (Page D) if the Page D data has been erased due to some reason.

Note 2: The data written in the adjustment data memo column are fixed.
After adjusting, check that these data have not been rewritten by mistake.

Note 3: In some case, data have been input to the page D address 91 to D3 and F0 to FF. This has no relation to the adjustment.

Address	Name	Function [ ] contains the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
00		Not used		
01		Not used		
02	TEST MODE (MECHA-CON)	Mecha-con (IC505) test mode	00	00
03	TEST MODE (MODE-CON)	Mode-con (IC503) test mode	00	00
04	SW POSITION (L)	Switching position adjustment (Low)	80	
05	SW POSITION (H)	Switching position adjustment (High)	0B	
06	BATTERY END	Battery end adjustment	66	
07	BATTERY PRE-END	Battery end adjustment	7F	
08	BATTERY LOW	Battery end adjustment	84	
09	BATTERY MIDDLE	Battery end adjustment	8A	
0A	BATTERY HIGH	Battery end adjustment	8E	
0B			00	00
0C		Not used		
0D		Not used		
0E		Not used		
0F		Not used		
10		Design data	00	00
11		Design data	00	00
12		Design data	00	00
13		Design data	00	00
14		Design data	95	95
15		Design data	77	77
16		Design data	01	01
17	VARIATION		02	02
18	FEATURE	CCD-FX430/FX435/FX530	04	04
		CCD-FX630	64	64
19	FEATURE		40	40
1A	FEATURE	CCD-FX430/FX435/FX630	58	58
		CCD-FX530	DC	DC
1B	FEATURE		20	20
1C	FEATURE		00	00
1D	FEATURE		00	00
1E		Not used		
1F		Not used		

Table 7-3-2. (1)

Address	Name	Function [ ] contains the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
20		Not used		
21		Not used		
22		Not used		
23			00	00
24		Design data	00	00
25		Design data	00	00
26		Design data	14	14
27		Design data	14	14
28		Design data	64	64
29		Design data	64	64
2A		Design data	6E	6E
2B		Design data	6E	6E
2C		Design data	64	64
2D		Design data	64	64
2E		Design data	6E	6E
2F		Design data	6E	6E
30		Design data	DC	DC
31		Design data	DC	DC
32	EVR REC C (SP L ME)	SP Normal ME REC C adjustment [IC951 ⑩]	DC	
33	EVR REC C (SP L MP)	SP Normal MP REC C adjustment [IC951 ⑩]	DC	
34			DC	DC
35			DC	DC
36	EVR REC C (LP L ME)	LP Normal ME REC C adjustment [IC951 ⑩]	DC	
37	EVR REC C (LP L MP)	LP Normal MP REC C adjustment [IC951 ⑩]	DC	
38	EVR REC LOW 1 (ME)	1ch ME REC L adjustment [IC951 ㊲]	E4	
39	EVR REC LOW 1 (MP)	1ch MP REC L adjustment [IC951 ㊲]	EB	
3A	EVR REC LOW 2 (ME)	2ch ME REC L adjustment [IC951 ㊲]	E4	
3B	EVR REC LOW 2 (MP)	2ch MP REC L adjustment [IC951 ㊲]	EB	
3C		Not used		
3D		Not used		
3E		Not used		
3F		Not used		
40		Not used		
41		Not used		
42	EVR REC Y 1CH (L ME)	1ch Normal ME REC Y level adjustment [IC951 ㊱]	A9	
43	EVR REC Y 1CH (L MP)	1ch Normal MP REC Y level adjustment [IC951 ㊱]	A9	
44		Not used		
45		Not used		
46	EVR REC Y 2CH (L ME)	2ch Normal ME REC Y level adjustment [IC951 ㊱]	A9	
47	EVR REC Y 2CH (L MP)	2ch Normal MP REC Y level adjustment [IC951 ㊱]	A9	
48		Not used		
49		Not used		

Table 7-3-2. (2)

Address	Name	Function [ ] contains the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
4A		Not used		
4B		Not used		
4C		Not used		
4D		Not used		
4E		Not used		
4F		Not used		
50			A2	A2
51			A1	A1
52		Not used		
53		Not used		
54			00	00
55			00	00
56			90	90
57			00	00
58			00	00
59			75	75
5A			E6	E6
5B			E6	E6
5C			E6	E6
5D			E6	E6
5E	EVR MT 1CH (L)	1ch Normal frequency characteristic adjustment [IC951 ⑱]	E6	
5F			E2	E2
60			E2	E2
61			E2	E2
62			E2	E2
63	EVR MT 2CH (L)	2ch Normal frequency characteristic adjustment [IC951 ⑳]	E2	
64		Not used		
65		Not used		
66		Not used		
67		Not used		
68		Not used		
69			E6	E6
6A			E6	E6
6B			E6	E6
6C			E6	E6
6D			E6	E6
6E		Not used		
6F		Not used		
70	EVR SYNC AGC	SYNC AGC adjustment [IC951 ㊳]	8E	
71	EVR COMB ADJ	Chroma comb filter adjustment [IC951 ㊴]	95	
72			B0	B0
73			B0	B0

Table 7-3-2. (3)

Address	Name	Function [ ] contains the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
74		Not used		
75	EVR CARRIER (L)	Normal Y-FM carrier frequency adjustment [IC951 ㊸]	BB	
76		Not used		
77	EVR DEVIATION (L)	Normal Y-FM deviation adjustment [IC951 ㊹]	97	
78			00	00
79			00	00
7A			86	86
7B			86	86
7C			00	00
7D			00	00
7E			00	00
7F			00	00
80	EVR C EMPH (EE)	EE chroma emphasis adjustment [IC951 ㊷]	99	
81	EVR C EMPH (PB)	PB chroma emphasis adjustment [IC951 ㊷]	99	
82	EVR EMPH (EE)	EE EMPH input level adjustment [IC951 ㊽]	A5	
83	EVR EMPH (PB)	PB EMPH input level adjustment [IC951 ㊽]	A9	
84		Not used		
85			69	69
86			00	00
87	EVR DE-EMPH (PB L)	Normal PB DE-EMPH level adjustment [IC951 ㊼]	69	
88			C0	C0
89			C0	C0
8A			00	00
8B			48	48
8C	EVR AUDIO MATRIX (EE)	EE matrix adjustment [IC951 ㉓] (CCD-FX530)	AF	
8D	EVR AUDIO MATRIX (PB)	PB matrix adjustment [IC951 ㉓] (CCD-FX530)	AF	
8E	EVR 1.5 MHz IR	1.5 MHz IR adjustment [IC951 ㉖] (CCD-FX430/FX435/FX630)	AF	
	EVR 1.7 MHz DEV	1.7 MHz deviation adjustment [IC951 ㉖] (CCD-FX530)	AF	
8F	EVR 1.5 MHz DEV	1.5 MHz deviation adjustment [IC951 ㉗]	AF	
90			60	60
91 to D3				
D4	CCD FLAW PATTERN	CCDimager correction data (for backup) ※ Refer "CCD Imager Correction Data Writing" of Camera Section Adjustments		
D5	CCD FLAW DATA			
D6	CCD FLAW DATA			
D7	CCD FLAW DATA			
D8	CCD FLAW DATA			
D9	CCD FLAW DATA			
DA	CCD FLAW DATA			
DB	CCD FLAW DATA			
DC	CCD FLAW DATA			
DD	CCD FLAW DATA			
DE	CCD FLAW DATA			

Table 7-3-2. (4)

Address	Name	Function [ ] contains the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
DF	CCD FLAW DATA	CCDimager correction data (for backup) ※ Refer "CCD Imager Correction Data Writing" of Camera Section Adjustments		
E0	CCD FLAW DATA			
E1	CCD FLAW DATA			
E2	CCD FLAW DATA			
E3	CCD FLAW DATA			
E4	EMERGENCY LAST CODE	Last emergency code	00	
E5	EMERGENCY LAST MODE	Last emergency mode	00	
E6		N.C.	00	
E7		N.C.	00	
E8	EMERGENCY 2ND CODE	2nd emergency code	00	
E9	EMERGENCY 2ND MODE	2nd emergency mode	00	
EA		N.C.	00	
EB		N.C.	00	
EC	EMERGENCY 1ST CODE	1st emergency code	00	
ED	EMERGENCY 1ST MODE	1st emergency mode	00	
EE		N.C.	00	
EF		N.C.	00	

Table 7-3-2. (5)

3-2. POWER SYSTEM ADJUSTMENTS

1. Oscillator Frequency Check (DD board)

Mode	Camera record
Subject	Arbitrary
Measurement Point	Q905 collector
Measuring Instrument	Frequency counter
Specified Value	500 ± 50 kHz

Adjusting method:

1) Check that the oscillator frequency satisfies the specified value.

2. Power Voltage Check (DD board)

Mode	Camera record
Subject	Arbitrary
Measuring Instrument	Digital voltmeter
D5V check	
Measurement Point	Pin ㉙ of CN901
Specified Value	4.9 ± 0.1 Vdc
EVF5V check	
Measurement Point	Pin ㊴ of CN901
Specified Value	4.9 ± 0.1 Vdc
VID 5V check	
Measurement Point	Pins ㉓ and ㉔ of CN901
Specified Value	4.9 ± 0.1 Vdc
AU 5V check	
Measurement Point	Pin ㉟ of CN901
Specified Value	4.9 ± 0.1 Vdc
RP 5V check	
Measurement Point	Pin ⑳ of CN901
Specified Value	4.9 ± 0.1 Vdc
CAM5V check	
Measurement Point	Pins ㉕ and ㉖ of CN901
Specified Value	4.85 ± 0.1 Vdc
SS 3.6V check	
Measurement Point	Pin ㉝ of CN901
Specified Value	3.6 ± 0.1 Vdc
D3.6V check	
Measurement Point	Pins ㉑ and ㉒ of CN901
Specified Value	3.6 ± 0.1 Vdc
CAM 15V check	
Measurement Point	Pin ㉗ of CN901
Specified Value	15 ± 0.3 Vdc
CAM –8.5V check	
Measurement Point	Pin ㉛ of CN901
Specified Value	$-8.5^{+0.25}_{-0.4}$ Vdc
MT 5V check	
Measurement Point	Pins ⑨, ⑱ and ⑲ of CN901
Specified Value	5.0 ± 0.1 Vdc

3-3. SYSTEM CONTROL SYSTEM ADJUSTMENTS

1. Page D Initial Value Input

If the page D data has been erased due to some cause, input the page D initial value before performing adjustments. For details on the initial value, refer to "Page D address list" in "3-1-8. Service Mode".

Mode	E-E
Signal	Arbitrary
Adjustment Page	D
Adjustment Address	00 to 90, (D4 to EF)

Input method:

1) Release the write protect.
   Page: 1, address: 00, data: 01
2) Select page D, and input the initial value to each address.
   (After setting the data (initial value), be sure to press the PAUSE button of the adjusting remote commander before changing the address.)

2. Battery End Adjustment

Set the battery end voltage.
If the voltage is incorrect, the life of the battery will shorten.
The image at the battery end will also be rough.

Mode	Camera record
Signal	Arbitrary
Measurement Point	LCD display of the adjusting remote control unit
Measuring Instrument	
Adjustment Page	D
Specified Value	06 (BATT END) 07 (BATT PRE-END) 08 (BATT LOW) 09 (BATT MIDDLE) 0A (BATT HIGH)

Connection:

1) Connect the regulated power supply and the digital voltmeter as shown in Fig. 7-3-5.

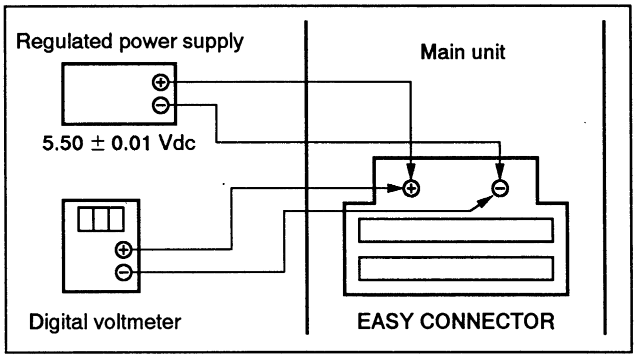


Fig. 7-3-5.

Adjusting method:

1) Adjust the output voltage of the regulated power supply so that the digital voltmeter display is 6.3 ± 0.1 Vdc.
2) Release the protect.
   Page: 1, address: 00, data: 01
3) Decrease the output voltage of the regulated power supply so that the digital voltmeter display is 5.50 ± 0.01 Vdc.
4) Set data: 01 to page: 2, address: 00.
   (Specification of category 01)
5) Select page: 2, address: 47, read the adjusting remote commander display data, and set to D6.
6) Set data D6 to page: D, address: 06, and press the PAUSE button of the adjusting remote commander.
7) Convert D47 to decimal notation, and obtain D47´. (Refer to Table 7-1-4. "Hexadecimal notation–decimal notation conversion table")
8) Calculate D7´, D8´, D9´ and DA´ using following equations (decimal notation calculation).
   D7´=D47´+3
   D8´=D47´+8
   D9´=D47´+14
   DA´=D47´+18
9) Convert D7´, D8´, D9´ and DA´ to hexadecimal notation, and obtain D7, D8, D9 and DA.
10) Set data: D7´ to page: D, address: 07, and press the PAUSE button of the adjusting remote commander.
11) Set data: D8´ to page: D, address: 08, and press the PAUSE button.
12) Set data: D9´ to page: D, address: 09, and press the PAUSE button.
13) Set data: DA to page: D, address: 0A, and press the PAUSE button.
14) Perform "Battery Down Check".

3. Battery Down Check

Mode	Camera record
Subject	Arbitrary

Connection

1) Connect the regulated power supply and the digital voltmeter as shown in Fig. 7-3-5.

Checking method:
Remove the adjusting remote commander, and perform the following check. If the check is not satisfied, perform from the beginning again.

1) Adjust the output voltage of the regulated power supply so that the digital voltmeter display becomes 6.3 ± 0.1 Vdc.
2) Set to the camera recording mode.
3) Check that the 🪫 mark on the EVF (viewfinder) display is not lighted up. (TALLY lamp lights up).
4) Decrease the the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.54 ± 0.01 Vdc.
5) Check that the 🪫 mark on the EVF display and the TALLY lamp blinks every second.
6) Decrease the the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.42 ± 0.01 Vdc.
7) Check that the 🪫 mark on the EVF display and the TALLY lamp are blinking faster, the VTR stops and the power supply turns off.

3-4. SERVO SYSTEM ADJUSTMENTS

1. Switching Position Adjustment (VS board)

Switching timing of video head setting. If deviated in this case causes switching noise or jitter on the played back screen.

Mode	Playback
Signal	Alignment tape: For tracking adjustment (WR5-1NP)
Measurement Point	CH1: Pin ④ of CN101 (RF SWP) CH2: Pin ③ of CN101 (PB RF)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	04 (SW POSITION) (LOW) 05 (SW POSITION) (HIGH)
Specified Value	t_1=0 ± 10 μsec

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Set data: 0B to page: D, address: 05.
3) Change the data of page: D, address: 05 and minimize "t1". (Coarse adjustment)
4) Change the data of page: D, address: 04, and adjust so that the switching position (t_1) becomes the specified value. (Fine adjustment)
5) Press the PAUSE button of the adjusting remote commander.

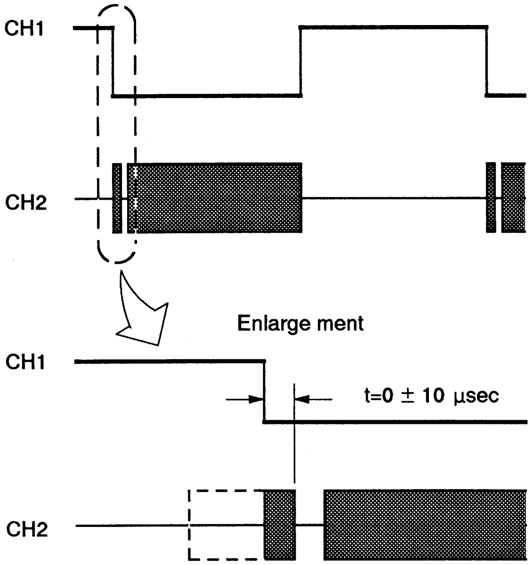


Fig. 7-3-6.

3-5. VIDEO ADJUSTMENTS

The adjustments of the video system must be performed according to the following adjustment procedure.
The color video signal supplied from the pattern generator is used as the video input signal for adjusting the video system in recording mode. Check that the sync signal and the color burst signal satisfy the specification specified during the adjustment set-up shown in Figs. 7-3-2. and 7-3-3.

[Adjusting procedure]

1) Playback frequency characteristics adjustment
2) Flying erase check
3) VXO oscillation frequency check
4) SYNC AGC level adjustment
5) Comb filter adjustment
6) Emphasis input level adjustment
7) WHITE CLIP check
8) DARK CLIP check
9) DE EMPH level adjustment
10) PB Y out level adjustment
11) Y FM carrier frequency adjustment
12) Y FM deviation adjustment
13) Chroma emphasis adjustment 1
14) Chroma emphasis adjustment 2
15) Comb filter fine adjustment
16) REC Y level adjustment
17) REC L adjustment
18) REC CHROMA level adjustment
19) REC ATF level check

1. Playback Frequency Characteristic Adjustment (VS board)

Eliminate the differences in the head characteristics of each channel. If there are differences, flickers and over modulation noises will be produced.

Note 1: The adjusting element for CH2 is shown in parentheses [ ].

Mode	Playback
Signal	Alignment tape: For frequency characteristic adjustment (WR5-6N)
Measurement Point	CH1: Pin ③ of CN102 (PB RF) EXT TRIG: Pin ④ of CN102 (RF SWP)
Measuring Instrument	Oscilloscope TRIG SLOPE: +, [–]
Adjustment Page	D
Adjustment Address	5E (MT 1CH (L)), [63 (MT 2CH (L))]
Specified Value	3.58 MHz level: 5.5 MHz level= 4: (3 ± 0.3)

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) After memorizing the data of page: D, address: 05, set data: 1A.
3) Press the PAUSE button of the adjusting remote commander.
4) Change the data of address: 5E [63] of page D, and adjust the level ratio of 3.58 MHz and 5.5 MHz of PB RF output waveform to the specified value.
   Note 2: After each address adjustment, be sure to press the PAUSE button of the adjusting remote commander and memorize the data.
5) Set the data memorized at step 2) to page: D, address: 05, and press the PAUSE button of the adjusting remote commander.

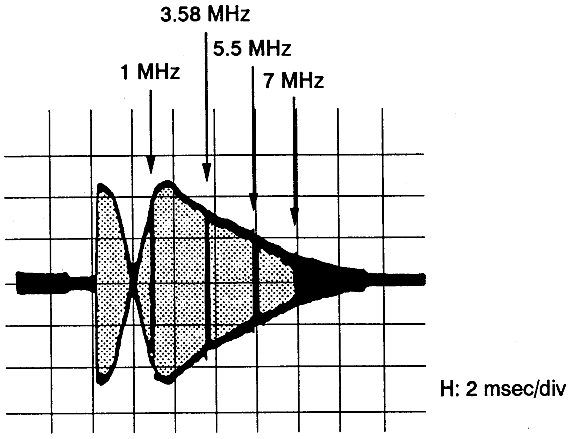


Fig. 7-3-7.

2. Flying Erase Check (VS board)

Mode	Camera record
Signal	Arbitrary
Measurement Point	Pin ⑫ of CN101 (FE (X))
Measuring Instrument	Oscilloscope and frequency counter
Specified Value	Frequency: 8.0 ± 0.5 MHz Voltage: 6.0 ± 1 Vp-p (ME tape) Above 7.0 Vp-p (MP tape)

Checking method:

1) Check that the oscillation frequency and the oscillation voltage satisfieds the specified value.

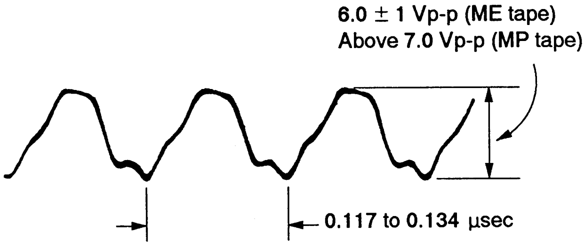


Fig. 7-3-8.

3. VXO Oscillation Frequency Check (VS board)

Mode	Camera record
Signal	Color bar
Measurement Point	Pin (61) of IC201
Measuring Instrument	Frequency counter
Specified Value	3579545 ± 50 Hz

Note: Connect the frequency counter via a high impedance (approximately 10 MΩ) and low capacity (below 10 pF) buffer.

Adjusting method:

1) Check that the oscillation frequency of pin (61) of IC201 is 3579545 ± 50 Hz.

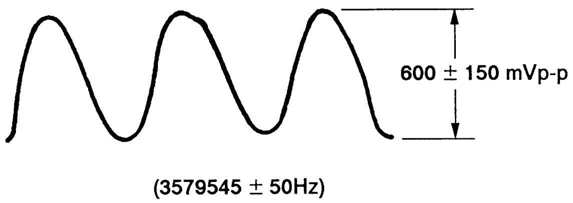


Fig. 7-3-9.

4. SYNC AGC Level Adjustment (VS board)

Adjust so that the Y signal level to be recorded becomes consistent. If it is not consistent, the camera EE image and OA image will be brighter or darker than normal.

Mode	Camera record
Signal	Color bar (Camera input) Note 1
Measurement Point	Pin ⑥ of CN201 (VIDEO I/O) Note 2
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	70 (SYNC AGC)
Specified Value	A=1.00 ± 0.025V

Note 1: The chroma signal input is not required.

Note 2: Terminate the video out terminal at 75Ω.
75Ω resistor (Part code: 1-247-804-11)

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 70, and adjust so that the Y signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote commander.

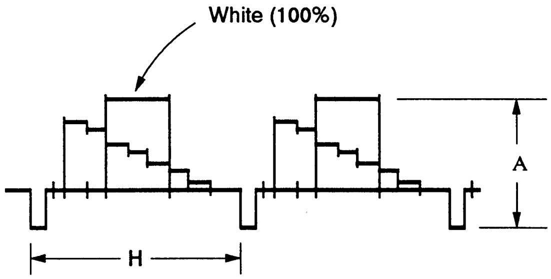
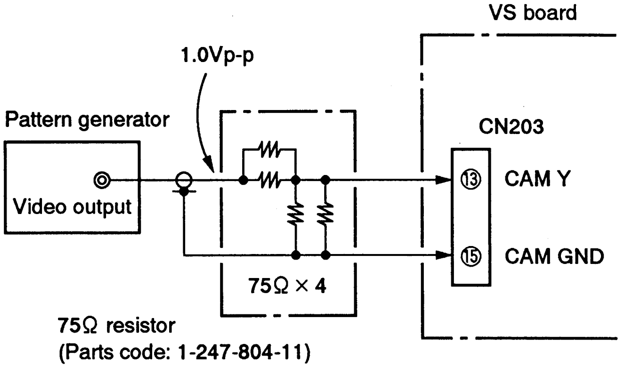


Fig. 7-3-10.

5. Comb Filter Adjustment (VS board)

Mode	Camera record
Signal	Color bar (Note 1)
Measurement Point	Pin ⑭ of IC201 (Y COMB OUT)
Measuring Instrument	Oscilloscope
Adjusting Element	RV202 (PHASE)
Adjustment Page	D
Adjustment Address	71 (COMB ADJ)
Specified Value	Residual chroma component (A) is minimum.

Note 1: Connect the pattern generator as shown in the following figure.



Adjusting method:

1) Set to the VIDEO input mode.
2) Set to the record mode.
3) Release the protect.
   Page: 1, address: 00, data: 01
4) Set data: 00 to page: 2, address: 00.
   (Specification of category 00)
5) Set data: 04 to page: 2, address: B0.
6) After memorizing the data of address: 9A of page: 2, set data: 10 to the address. (TEST A mode setting)
7) After memorizing the data of address: 9D of page: 2, set data: 30 to the address.
8) Change the data of page: D, address: 71, and adjust the residual chroma component (A) to minimum.
9) Adjust RV202 so that the residual chroma component becames minimum.
10) Repeat 8) and 9).
11) Press the PAUSE button of the adjusting remote commander.

Processing after completing adjustments

1) Set the data memorized at step 7) to address: 9D of page: 2.
2) Set the data memorized at step 6) to address: 9A of page: 2.
3) Set data: 00 to page: 2, address: B0.
   (Release of TEST A, B mode)

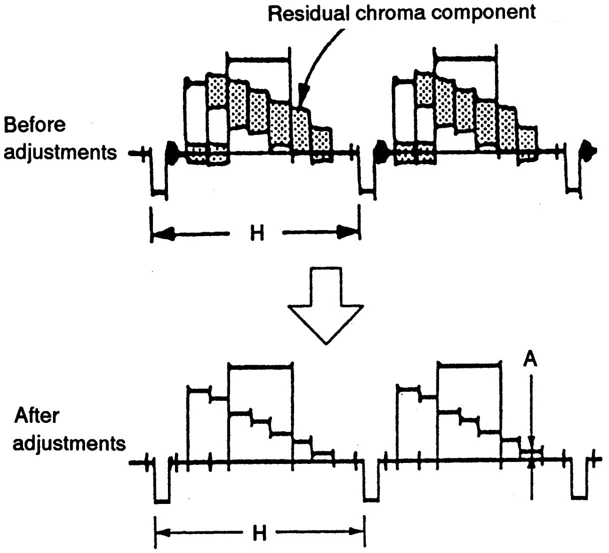

Residual chroma component
Before adjustments
H
After adjustments
A
H

Fig. 7-3-11.

6. Emphasis Input Level Adjustment (VS board)

Y level of emphasis circuit setting. If deviated, this causes too bright or too dark image during play back after recording.

Mode	Camera record
Signal	Color bar (CAMERA input)
Measurement Point	Pin ⑤ of IC201 (EMPH IN) or Pin ⑤ of IC205
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	82 (EMPH (EE))
Specified Value	A=0.50 ± 0.01V

Note 1: The chroma signal input is not required.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 82, and adjust so that the Y signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote commander.

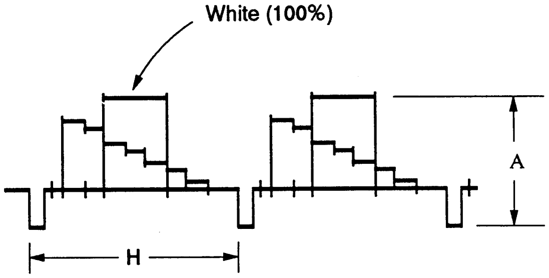

White (100%)
A
H

Fig. 7-3-12.

7. WHITE CLIP check (VS board)

Mode	Camera record
Signal	Color bar (CAMERA input)
Measurement Point	Pin ㊴ of IC201 (Y RF OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	MP tape: 7B: (W CLIP (SP L MP)) ME tape: 7A: (W CLIP (SP L ME))
Specified Value	A=220 ± 10%

Note 1: The data of address 7B and 7A are fixed value. (The data of address 7B and 7A are "86".)

Note 2: The chroma signal input is not required.

Checking method:

1) Set to the record mode.
2) Set data: 00 to page: 2, address: 00. (Specification of category 00)
3) Set data: 04 to page: 2, address: B0.
4) After memorizing the data of address: 9A of page: 2, set data: 01 to the address. (TEST 2 mode setting)
5) Check that the white clip level (A) satisfies the specified value.

Processing after completing adjustments

1) Set the data memorized at step 4) to address: 9A of page: 2.
2) Set data: 00 to page: 2, address: B0. (Release of TEST 2 mode)

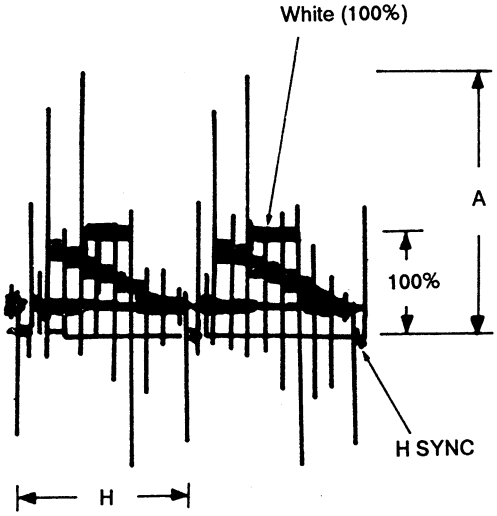


Fig. 7-3-13.

8. DARK CLIP check (VS board)

Mode	Camera record
Signal	Color bar (CAMERA input)
Measurement Point	Pin ㊴ of IC201 (Y RF OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	24 (D CLIP 1) 25 (D CLIP 2)
Specified Value	A=110 ± 10%

Note 1: The data of address 24 and 25 are fixed value. (The data of address 24 and 25 are "00".)

Note 2: The chroma signal input is not required.

Note 3: The chroma signal input is not required.

Checking method:

1) Set to the record mode.
2) Set data: 00 to page: 2, address: 00. (Specification of category 00)
3) Set data: 04 to page: 2, address: B0.
4) After memorizing the data of address: 9A of page: 2, set data: 01 to the address. (TEST 2 mode setting)
5) Check that the dark clip level (A) satisfies the specified value.

Processing after completing adjustments

1) Set the data memorized at step 4) to address: 9A of page: 2.
2) Set data: 00 to page: 2, address: B0. (Release of TEST 2 mode)

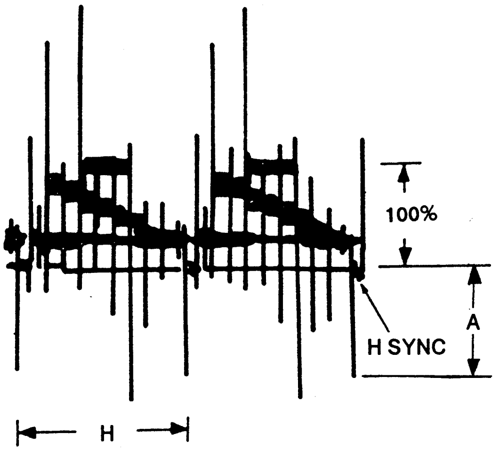


Fig. 7-3-14.

9. DE EMPH Level Adjustment (VS board)

De-emphasis input level setting. If deviated, this causes excessive brightness or darkness.

Mode	Playback
Signal	Alignment tape: For checking operations Color bar section (WR5-5NSP)
Measurement Point	Pin ㉓ of IC201 (DL IN 1)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	87 (DE-EMPH (PB L))
Specified Value	A=0.54 ± 0.01V

Note 1: The chroma signal input is not required.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 87, and adjust so that the Y signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote commander.
4) Perform "PB Y OUT Level Adjustment".

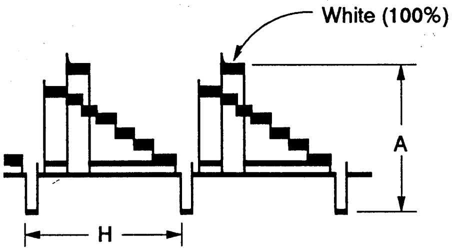


Fig. 7-3-15.

10. PB Y OUT Level Adjustment

PB LINE OUT Y level setting. If deviated, this causes too bright or too dark picture.

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Color bar section
Measurement Point	Pin ⑥ of CN201 (VIDEO I/O)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	83 (EMPH (PB))
Specified Value	A=1.0 ± 0.05V

Note 1: Terminate the video out terminal at 75Ω.
75Ω resistor (Part code: 1-247-804-11)

Note 2: The chroma signal input is not required.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 83, and adjust so that the video signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote commander.

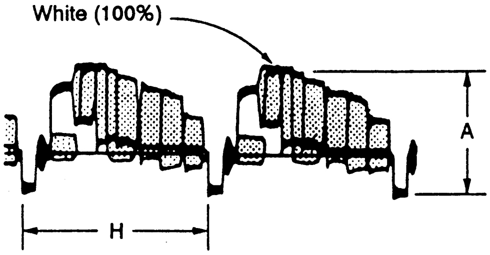


Fig. 7-3-16.

11. Y FM Carrier Frequency Adjustment (VS board)

FM carrier frequency of REC Y setting. If deviated, this caused blurred played back picture or deteriorated resolution.

Mode	Record
Signal	No signal (CAMERA input)
Measurement Point	Pin ㊴ of IC201 (Y RF OUT) (JL209)
Measuring Instrument	Frequency counter
Adjustment Page	D
Adjustment Address	75 (CARRIER (L))
Specified Value	4.385 ± 0.01 MHz

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 75, and adjust so that the Y FM carrier frequency becomes the specified value.
3) Press the PAUSE button of the adjusting remote commander.

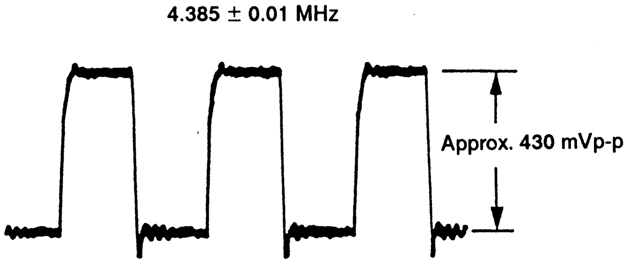


Fig. 7-3-17.

12. Y FM Deviation Adjustment (VS board)

FM deviation of REC Y setting. If deviated, this causes too bright/dark image, or marked occurrence of black picture or deteriorated resolution.

Mode	Record and playback
Signal	Color bar (CAMERA input)
Measurement Point	Pin ㉓ of IC201 (DL IN 1)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	77 (DEVIATION (L))
Specified Value	A=0.54 ± 0.01V

Note 1: Check that “Emphasis Input Level Adjustment”, have been completed.

Note 2: The chroma signal input is not required.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Record the color bar signal.
3) Playback the recorded signal.
4) Check the playback signal level (A).
   Specification:A=0.54 ± 0.01V
5) If the specification is not satisfied, change the data of page: D, address: 77, and repeat steps 2) to 4).

Playback signal level	Changing the data
When smaller than the specified value	Increase
When bigger than the specified value	Decrease

6) Press the PAUSE button of the adjusting remote commander.
7) Perform “Y FM Carrier Frequency Adjustment”.

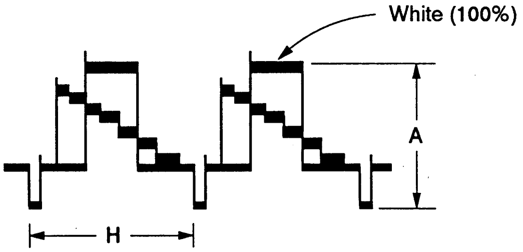


Fig. 7-3-18.

13. Chroma Emphasis Adjustment 1 (VS board)

Emphasis center frequency setting. If deviated, this causes unnatural color.

Mode	Record
Signal	Color bar (CAMERA input)
Measurement Point	Pin ⑧ of IC201 (REC C OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	80 (C EMPH (EE)) 81 (C EMPH (PB))
Specified Value	Minimum f_0 component

Adjusting method:

1) Set to the record mode.
2) Release the protect.
   Page: 1, address: 00, data: 01
3) Set data: 00 to page: 2, address: 00.
   (Specification of category 00)
4) Set data: 04 to page: 2, address: B0.
5) After memorizing the data of address: 9A of page: 2, set data: 02 to the address. (TEST 1 mode setting)
6) Change the data of page: D, address: 80, and adjust so that the amplitude of the latter section of the chroma signal (yellow section) becames minimum.
7) Press the PAUSE button of the adjusting remote commander.
8) Set the same data as address: 80 of page: D to address: 81 of page D.
9) Press the PAUSE button of the adjusting remote commander.

Processing after completing adjustments

1) Set the memorized at step 5) to address: 9A of page: 2.
2) Set data: 00 to page: 2, address: B0.
   (Release of TEST 1 mode)

Minimize the amplitude of the latter section of the yellow section.

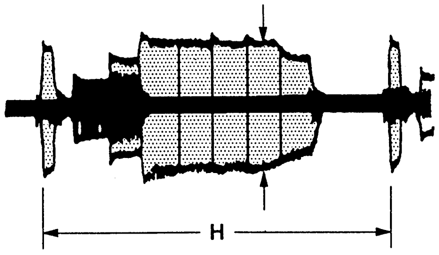


Fig. 7-3-19.

14. Chroma Emphasis Adjustment 2 (VS board)

Emphasis center frequency setting. If deviated, this causes unnatural color.

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Color bar section
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	D
Adjustment Address	81 (C EMPH (PB)) 80 (C EMPH (EE))
Specified Value	The path from the blue luminance point to black luminance point should be a straight line.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 81, and adjust so that the path from the blue luminance point to black luminance point becames a straight line.
3) Press the PAUSE button of the adjusting remote commander.
4) Set the same data as address: 81 of page: D to address: 80 of page: D.
5) Press PAUSE button of the adjusting remote commander.

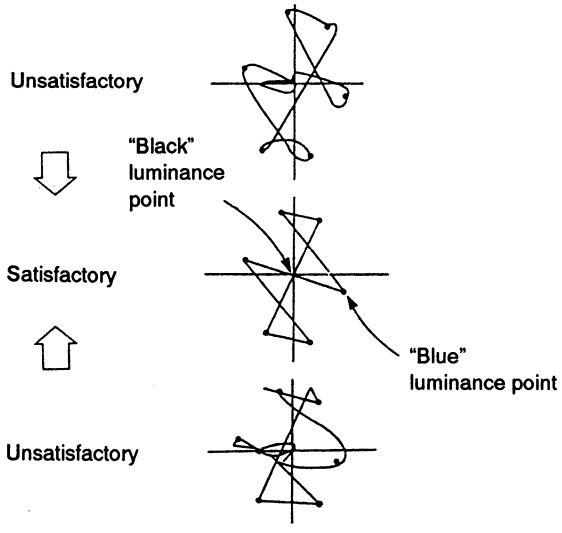


Fig. 7-3-20.

15. Comb Filter Fine Adjustment (VS board)

Set the level and phase of the 1H delayed signal for the comb filter. If deviated, this causes marked occurrence of beets in played back picture.

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Color bar section
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjusting Element	RV202 (PHASE)
Adjustment Page	D
Adjustment Address	71 (COMB ADJ)
Specified Value	Minimum color luminance point movement when the "Edit" switch is turned on/off

Note 1: Turn the edit ON/OFF at the menu screen.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Minimize the movements of the color luminance point when the edit is on/off with RV202.
3) Change the data of page: D, address: 71 and minimize the movements of the color luminance point when the edit is on/off
4) Press the PAUSE button of the adjusting remote commander.
5) Repeat steps 2) to 4).

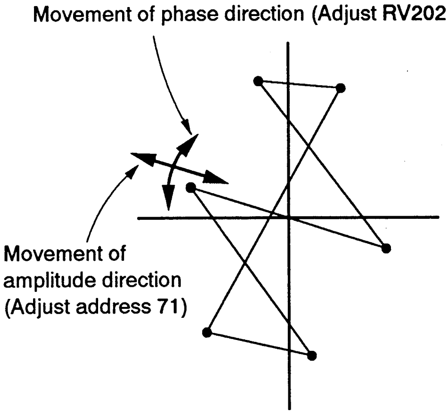

Movement of phase direction (Adjust RV202)
Movement of amplitude direction (Adjust address 71)

Fig. 7-3-21.

16. REC Y Level Adjustment (VS board)

Recording level of luminance signal setting. If deviated, this causes black stretch over modulation noise or color shade.

Mode	Record
Signal	No signal
Measurement Point	Pin ⑥ of CN102 (REC 2)
Measuring Instrument	Oscilloscope Board width limit: 20 MHz
Adjustment Page	D
Adjustment Address	47 (REC Y 2CH (L MP)) 43 (REC Y 1CH (L MP)) 46 (REC Y 2CH (L ME)) 42 (REC Y 1CH (L ME))
Specified Value	A=145 ± 5 mVp-p

Note: Use a normal MP type tape.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 47, and adjust so that REC Y level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote commander.
4) Set data to address: 42, 43, 46 of page: D as shown in following table.
   (Be sure to press the PAUSE button of the adjusting remote commander after setting each data.)

Address	Data
42	Same data as address: 47
43	Same data as address: 47
46	Same data as address: 47

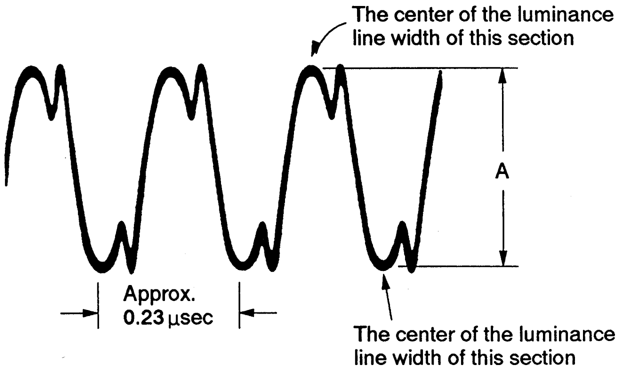

The center of the luminance line width of this section
A
Approx. 0.23 μsec
The center of the luminance line width of this section

Fig. 7-3-22.

17. REC L Adjustment (VS board)

Set the recording levels of the REC AFM signal and REC ATF signal. If the level is too low, the audio S/N will deteriorate, tracking will not be stable, or SP/LP will not be discriminated properly. If too high, color beets will be produced on the self-recording/playback image.

Mode	Record
Signal	No signal (VIDEO input)
Measurement Point	Pin ⑥ of CN102 (REC 2)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	3B (REC LOW 2 (MP)) 39 (REC LOW 1 (MP)) 3A (REC LOW 2 (ME)) 38 (REC LOW 1 (ME))
Specified Value	A=6.7 ± 1.0 mVp-p

Note 1: Use a MP type tape.
Note 2: AU board is required for this adjustment.
Note 3: For CCD-FX530, do not insert any plug into the right audio input terminal.

Connection:
1) Connect Emitter of Q113 and GND with a jumper wire.
2) Connect Pin ⑤ of IC508 and GND with a 0.01 μF capacitor.

Adjusting method:
1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 3B, and adjust so that the REC AFM signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote commander.
4) Read the data of page: D, address: 3B, and set to D3B.
5) Set data: D3B to address: 39 of page D.
6) Press the PAUSE button of the adjusting remote commander.
7) Convert D3B to decimal notation, and obtain D3B′.
   (Refer to Table 7-1-3. "Hexadecimal notation-decimal notation conversion table")
8) Culculate D3A′ using following equation (decimal notation calculation).
   D3A′=D3B′–7
9) Convert D3A′ to hexadecimal notation, and obtain D3A.
10) Set data: D3A to address: 3A of page D.
11) Press the PAUSE button of the adjusting remote commander.
12) Set data: D3A to address: 38 of page D.
13) Press the PAUSE button of the adjusting remote commander.
14) Perform "REC CHROMA Level Adjustment".

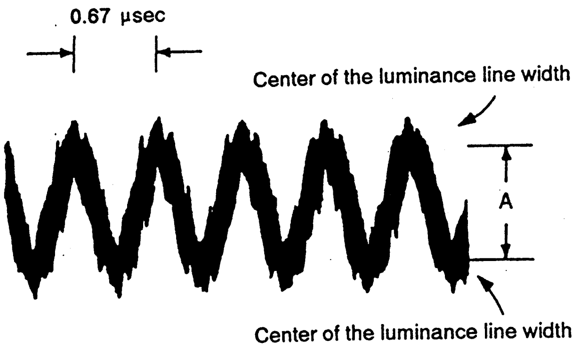

0.67 μsec
Center of the luminance line width
A
Center of the luminance line width

Fig. 7-3-23.

18. REC CHROMA Level Adjustment (VS board)

Set REC CHROMA signal level. If it is lower than its normal level, chroma signal noise in played back picture will increase. If it is set higher, Y signal noises will increase and white modulation noises will be prodused.

Mode	Record
Signal	Color bar (VIDEO input)
Measurement Point	Pin ⑥ of CN102 (REC 2)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	33 (REC C (SP L MP)) 32 (REC C (SP L ME)) 37 (REC C (LP L MP)) 36 (REC C (LP L ME))
Specified Value	A=29 ± 3 mVp-p

Note 1: Use a MP type tape.

Connection:
1) Connect Emitter of Q113 and GND with a jumper wire.
2) Connect Pin ⑤ of IC508 and GND with a 0.01 μF capacitor. (1-101-004-00)
3) Disconnect AU board.

Adjusting method:
1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 33, and adjust so that the REC CHROMA signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote commander.
4) Read the data of page: D, address: 33, and set to D33.
5) Set data: D33 to address: 32 of page D.
6) Press the PAUSE button of the adjusting remote commander.
7) Set data: D33 to address: 36 of page D.
8) Press the PAUSE button of the adjusting remote commander.
9) Set data: D33 to address: 37 of page D.
10) Press the PAUSE button of the adjusting remote commander.

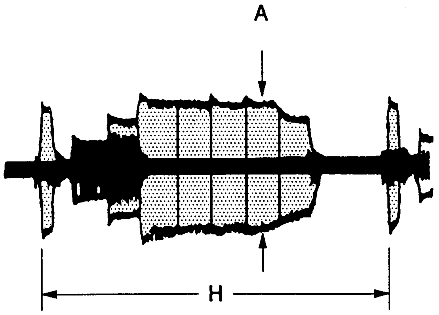


Fig. 7-3-24.

19. REC ATF Level Check (VS board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑥ of CN102 (REC 2)
Measuring Instrument	Oscilloscope
Specified Value	A=6.4 ± 1.5 mVp-p

Note 1: Use a MP type tape.

Connection:
1) Connect Emitter of Q113 and GND with a jumper wire.
2) Disconnect AU board.

Adjusting method:
1) Check that the REC ATF signal level (A) satisfise the specified value.

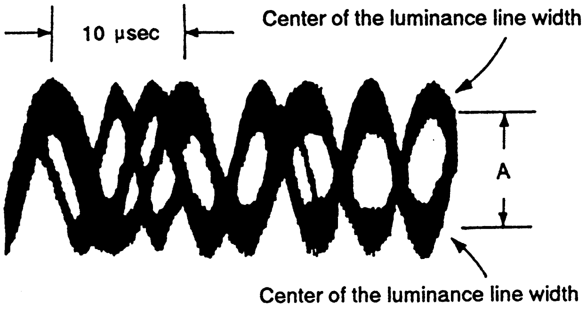

10 μsec
Center of the luminance line width
A
Center of the luminance line width

Fig. 7-3-25.

3-6. AUDIO SYSTEM ADJUSTMENT (CCD-FX430/FX435/FX630)

- Perform the adjustment using the color bar signal as a video signal input for VIDEO terminal

[Connecting the measuring instruments for the audio]

Connect the audio system measuring instruments besides the video system measuring instruments as shown in Fig. 7-3-26, and perform adjustments with the power switch [player] position.

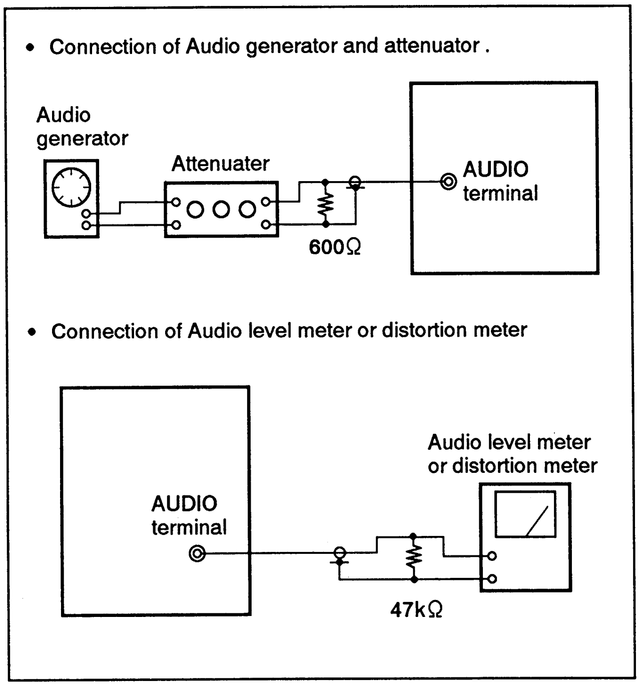

• Connection of Audio generator and attenuator.
Audio generator
Attenuater
AUDIO terminal
600Ω
• Connection of Audio level meter or distortion meter
Audio level meter or distortion meter
AUDIO terminal
47kΩ

Fig. 7-3-26.

[Adjustment Procedure]

1) E-E output level check
2) IR adjustment
3) Deviation adjustment
4) Carrier frequency check
5) Carrier level check
6) Overall level characteristics, distortion check
7) Overall noise level check

1. E-E Output Level Check (AU-157 board)

Mode	Record
Signal	400 Hz, –7.5 dBs, Audio input terminal
Measurement Point	Pin ⑲ of IC401
Measuring Instrument	Audio level meter
Specified Value	–7.5 ± 2 dBs

Checking method:

1) Check that the 400 Hz signal level satisfies the specified value.

2. IR Adjustment

Adjust to the optimum audio BPF characteristics of the IC.
If the characteristics is not correct, the distortion rate and S/N ratio will worsen.

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP)
Measurement Point	Audio output terminal
Measuring Instrument	Distortion meter
Adjustment Page	D
Adjustment Address	8E (1.5 MHz IR)
Specified Value	Minimum distortion

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 8E and adjust so that the distortion is minimum.
3) Press the PAUSE button of the adjusting remote commander.

3. Deviation Adjustment

Adjust to the optimum audio FM signal deviation.
If the adjustment is not correct, its playback level will differ from that of other units.

Mode	Playback
Signal	Alignment tape: For checking the operation (WR5-5NSP)
Measurement Point	Audio output terminal
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	8F (1.5 MHz DEV)
Specified Value	–7.5 ± 0.5 dBs

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 8F, and adjust so that the 400 Hz signal level becomes the specified value.
3) Press the PAUSE button of the adjusting remote commander.

4. Carrier Frequency Check (AU-157 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑨ of CN401 (REC AFM RF)
Measuring Instrument	Frequency counter (Note 1)
Specified Value	1.500 ± 0.002 MHz

Note: Use a high impedance (above 1 MΩ) and low capacity (below 20 pF) probe.

Checking method:
1) Check that the 1.5 MHz carrier frequency satisfies the specified value.

5. Carrier Level Check (AU-157 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑨ of CN401 (REC AFM RF)
Measuring Instrument	Oscilloscope
Specified Value	A=340 ± 40 mVp-p

Checking method:
1) Check that the 1.5 MHz carrier level satisfies the specified value.

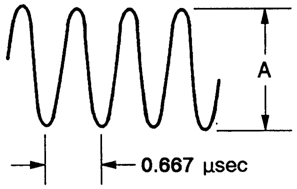


Fig. 7-3-27.

6. Overall Level Characteristic, Distortion Check

Mode	Self recording/playback
Signal	400 Hz, –7.5 dBs, Audio input terminal
Measurement Point	Audio output terminal
Measuring Instrument	Audio level meter and distortion meter
Specified Value	Level: –7.5 ± 2.5 dBs Distortion rate: Below 0.5% (Note 1)

Note: 1) Value when the following filter is used

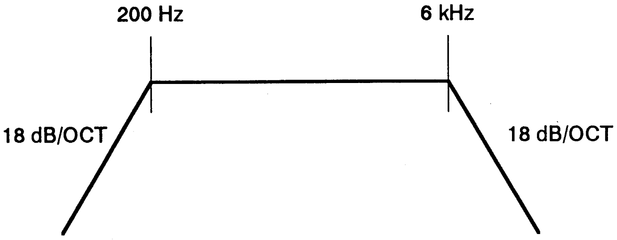


Fig. 7-3-28.

Checking method:
1) Input the 400 Hz, –7.5 dBs signal to the audio input terminal.
2) Record the signal.
3) Remove the input signal.
4) Playback the recorded section.
5) Check that the 400 Hz signal level of the audio output terminal is –7.5 ± 2.5 dBs, and that the distortion rate is below 0.5% (Note 1).

7. Overall Noise Level Check

Mode	Self recording
Signal	No signal: Audio input terminal
Measurement Point	Audio output terminal
Measuring Instrument	Audio level meter (Use an IHF-A curve auditory correction filter)
Specified Value	Below –65.0 dBs

Checking method:
1) Insert the shorting plug to the audio input terminal.
2) Record.
3) Remove the shorting plug.
4) Playback the recorded section.
5) Check that the noise level of the audio output terminal is below –65.0 dBs.

3-7. AUDIO SYSTEM ADJUSTMENT (CCD-FX530)

- Perform the adjustment using the color bar signal as a video signal input for VIDEO terminal.

[Connecting the measuring instruments for the audio]

Connect the audio system measuring instruments in addition to the video system measuring instruments as shown in Fig. 7-3-29, and perform adjustments at the power switch [player] position.

Set the Hi-Fi SOUND switch in the menu display to the following position unless specified otherwise.

- Stereo position

Note: 1) When inputting the audio signal, input the same signal to both L, and R channels, unless specified otherwise.

2) Be sure to insert the plug (shorting plug or dummy plug, etc.) into the audio terminal (right). If the plug is not inserted, the unit will be set into the monaural mode, and correct adjustments cannot be carried out.
(Monaural mode)
During recording ·· REC AFM RF1.7 MHz carrier will not be output.
During playback ·· The L+R signal will be output from the audio terminal (left).

3) The items to be adjusted for the R channel will be indicated within the [ ], in regard to the adjusting items to be adjusted for both L and R channels.

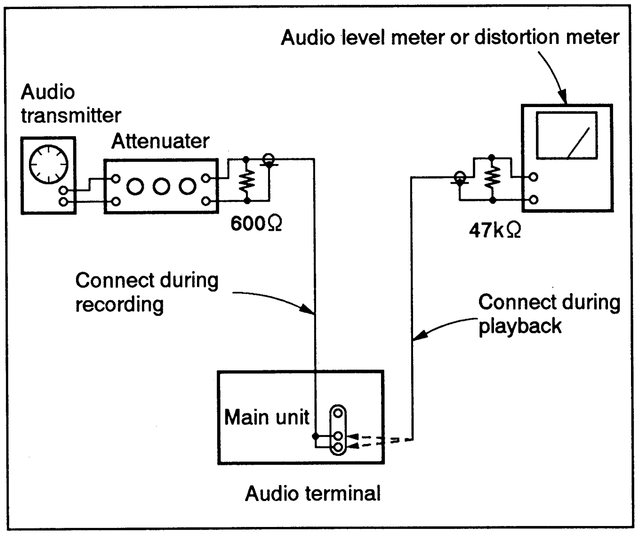


Fig. 7-3-29.

[Adjustment Procedure]

1) E-E output level check
2) REC matrix L–R adjustment
3) REC matrix L+R check
4) 1.5 MHz deviation adjustment
5) 1.7 MHz deviation adjustment
6) Overall level characteristics, distortion check
7) Separation check
8) Overall noise level check

1. E-E Output Level Check (AU-168 board)

Mode	Record
Signal	400 Hz, –7.5 dBs audio input terminal right [left]
Measurement Point	Pin ㊾ of IC1301 [Pin ㊿ of IC1301]
Measuring Instrument	Oscilloscope
Specified Value	925^{+240}_{-190} mVp-p (–7.5 ± 2 dBs)

Checking method:

1) Check that the 400 Hz signal level satisfies the specified value.

2. Matrix L-R Adjustment (AU-168 board)

Adjust the audio matrix. If improper, this causes deteriorated separation (with stereo signal).

Mode	Record
Signal	400 Hz, –7.5 dBs Input to both left and right terminals of the audio input terminal
Measurement Point	Pin ⑤ of IC1301
Measuring Instrument	Oscilloscope (Use 1:1 probe)
Adjustment Page	D
Adjustment Address	8C (AUDIO MATRIX (EE)) 8D (AUDIO MATRIX (PB))
Specified Value	0 ± 20 mVp-p

Adjusting method:

1) Release the protect.
Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 8C, and minimize the 400 Hz signal level.
3) Press the PAUSE button of the adjusting remote commander.
4) Set the same data as address: 8C of page: D to address: 8D of page: D.
5) Press the PAUSE button of the adjusting remote commander.

3. REC Matrix L+R Check (AU-168 board)

Mode	Record
Signal	1. 400 Hz, –7.5 dBs: Audio input terminal left No signal: Audio input terminal right 2. No signal: Audio input terminal left 400 Hz, –7.5 dBs: Audio input terminal right
Measurement Point	Pin ㊹ of IC1301
Measuring Instrument	Oscilloscope
Specified Value	The level difference is 0 ± 10 mVp-p when only the left terminal is input and when only the right terminal is input.

Note: When measuring the signal level of pin ㊹ of IC1301, wait for more than 1 minute after signal input before measuring. (To stabilize the AGC)

Adjusting method:
1) Input the 400 Hz, –7.5 dBs signal only to the audio input terminal (left). (Insert the shorting plug to the audio input terminal (right).)
2) Read the 400 Hz signal level of pin ㊹ of IC1301, and take it down. (Approximately 250 mVp-p)
3) Input the 400 Hz, –7.5 dBs signal only to the audio input terminal (right). (Insert the shorting plug to the audio input terminal (left).)
4) Check that the 400 Hz signal level of pin ㊹ of IC1301 is (the value that was taken down at step 2) ± 10 mVp-p.

4. 1.5 MHz Deviation Adjustment

Adjusts the 1.5 MHz AFM signal deviation. If improper, this causes deteriorated separation with Alignment tape (with stereo signal) and the playback level will differ from that of other unit.

Mode	Playback
Signal	Alignment tape: For checking the operation (WR5-5NSP)
Measurement Point	Audio output terminal left or right
Measuring Instrument	Oscilloscope, Level meter
Adjustment Page	D
Adjustment Address	8F (1.5 MHz DEV)
Specified Value	–7.5 ± 0.5 dBs

Adjusting method:
1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 8F, and adjust so that the 400 Hz signal level becomes the specified value.
3) Press the PAUSE button of the adjusting remote commander.

5. 1.7 MHz Deviation Adjustment

Adjust the 1.7 MHz AFM deviation. If improper, this causes deteriorated separation (with stereo signal).

Mode	Playback
Signal	Alignment tape: AFM stereo for checking operation (WR5-9NS) Stereo (color bar) section
Measurement Point	Audio output terminal right
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	8E (1.7 MHz DEV)
Specified Value	Cross talk component is below 30 mVp-p

Adjusting method:
1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 8D, and minimize the cross talk component (400 Hz).
3) Press the PAUSE button of the adjusting remote commander.

6. Overall Level Characteristics, Distortion Check

Mode	Self recording/playback
Signal	400 Hz, –7.5 dBs: Audio input terminal (left) [right] No signal: Audio input terminal (right) [left]
Measurement Point	Audio output terminal (left) [right]
Measuring Instrument	Audio level meter and distortion meter
Specified Value	Level: –7.5 ± 2 dBs Distortion rate: Below 0.8% (Note 2)

Note: 1) The [ ] indicates the measuring point during the right channel check.
2) Value when the 200 kHz to 6 kHz band-path filter is used

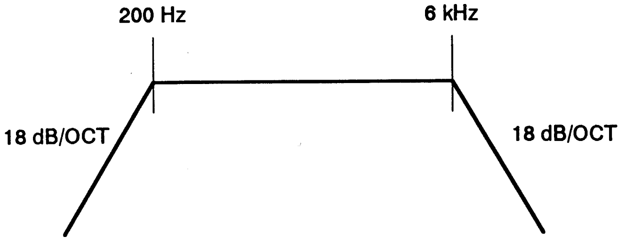


Fig. 7-3-30.

Checking method:

1) Input the 400 Hz, –7.5 dBs signal only to the audio input terminal (left) [right].
   Note: Be sure to insert the shorting plug to the terminal that was not signal input.
2) Record the signal.
3) Remove the input signal.
4) Playback the recorded section.
5) Check that the 400 Hz signal level of the audio output terminal (left) [right] is –7.5 ± 2 dBs, and that the distortion rate is below 0.8% (Note 2).

7. Separation Check

Mode	Self recording /playback
Signal	No signal: Audio input terminal (left) [right] 400 Hz, –7.5 dBs: Audio input terminal (right) [left]
Measurement Point	Audio output terminal (left) [right]
Measuring Instrument	Audio level meter (Use an IHF-A curve auditory correction filter)
Specified Value	Below –27.5 dBs

Note: The [ ] indicates the measuring point during the right channel check.

Checking method:

1) Insert a shorting plug into the audio input terminal (left) [right], and input a 1kHz, –7.5 dBs signal only to the audio input terminal (right) [left].
2) Record the signal.
3) Remove the input signal.
4) Playback the recorded section.
5) Check that the cross talk level (1 kHz) of the audio output terminal (left) [right] is below –27.5 dBs.

8. Overall Noise Level Check

Mode	Self recording/playback
Signal	No signal: Audio input terminal left and right
Measurement Point	Audio output terminal (left) [right]
Measuring Instrument	Audio level meter (Use an IHF-A curve auditory correction filter)
Specified Value	Below –62.5 dBs

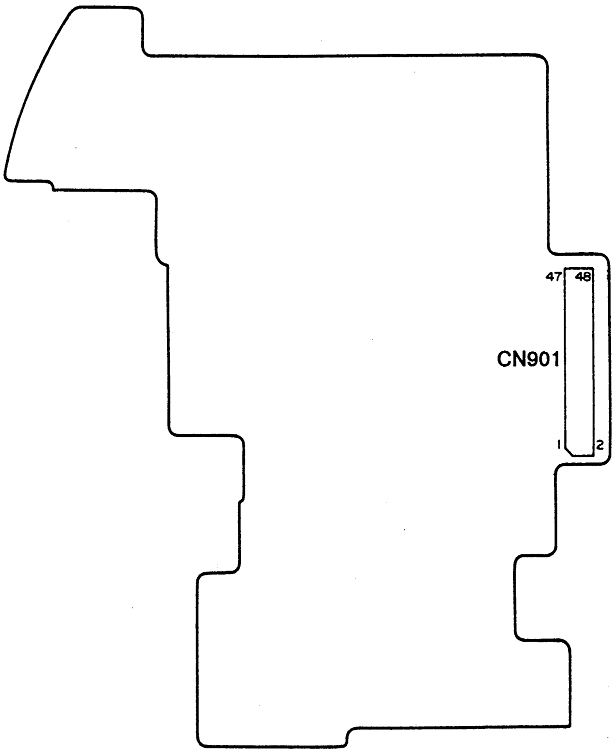
Note: The [ ] indicates the measuring point during the right channel check.

Checking method:

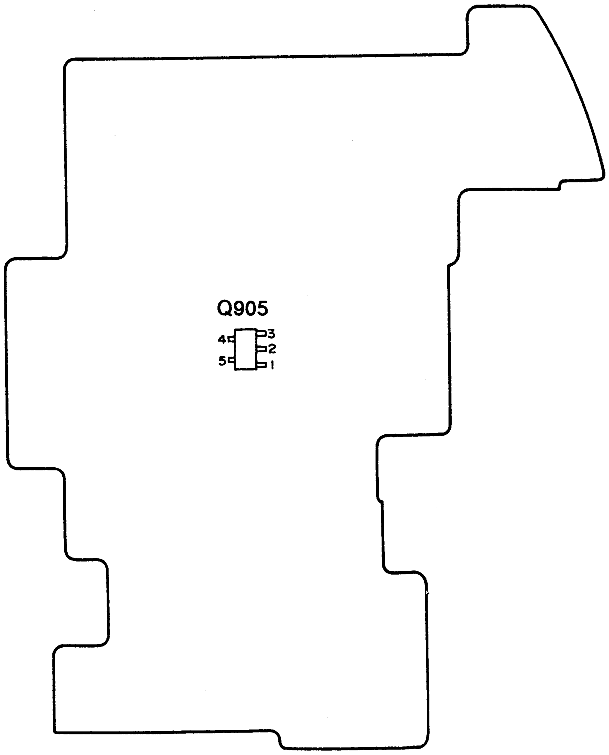
1) Insert the shorting plug to both left and right of the audio input terminals.
2) Record.
3) Remove the shorting plug.
4) Playback the recorded section.
5) Check that the noise level of the audio output terminal (left) [right] is below –62.5 dBs.

3-8. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

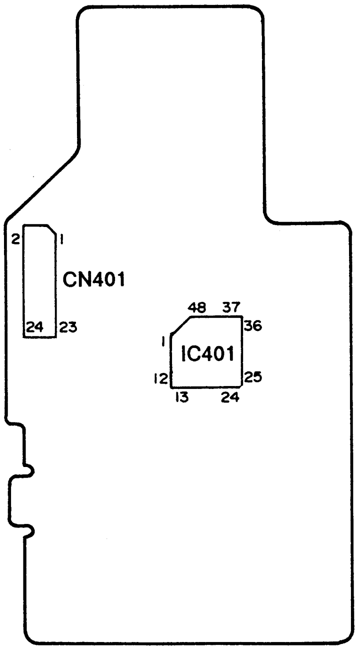
DD BOARD (COMPONENT SIDE)


CN901
47
48
1
2

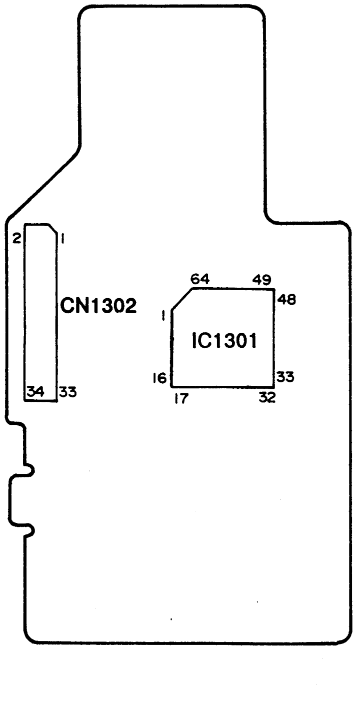
DD BOARD (CONDUCTOR SIDE)



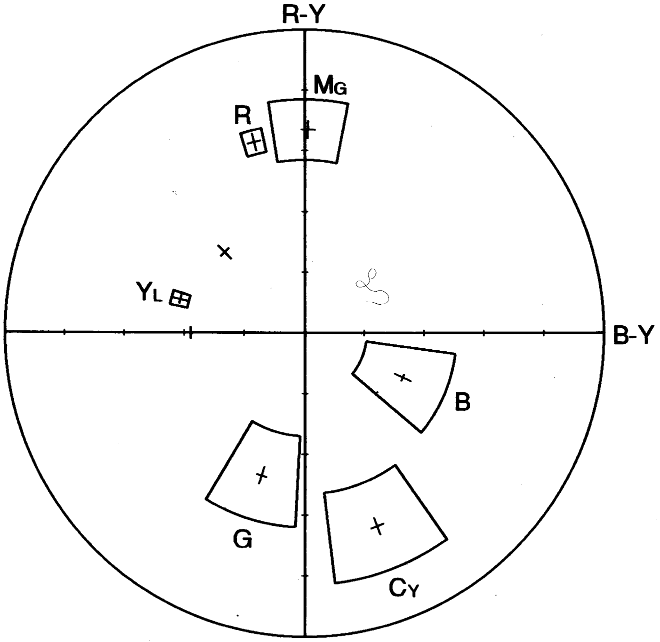
AU-157 BOARD (COMPONENT SIDE) (CCD-FX430/FX435/FX630)


2
1
CN401
24
23
48
37
36
1
IC401
12
25
13
24

AU-168 BOARD (COMPONENT SIDE) (CCD-FX530)

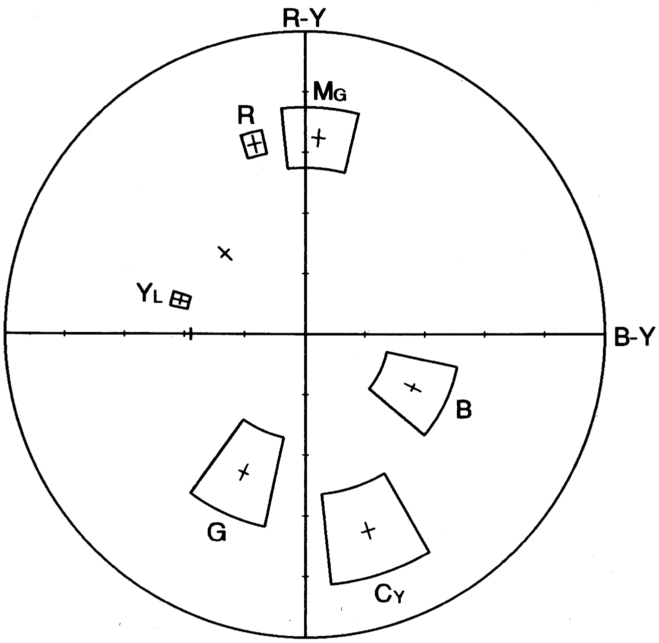

2
1
CN1302
34
33
64
49
48
1
IC1301
16
33
17
32

FOR CAMERA COLOR REPRODUCTION ADJUSTMENT


R-Y
MG
R
YL
B-Y
B
G
CY

CCD-FX430/FX435/FX530

FOR CAMERA COLOR REPRODUCTION ADJUSTMENT

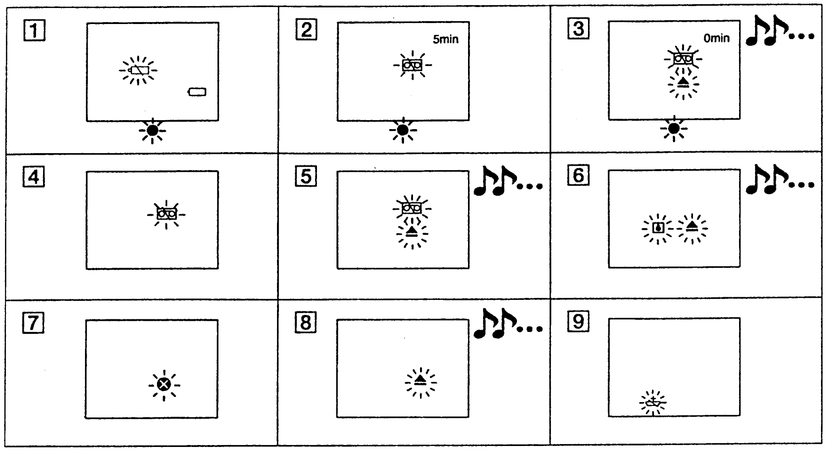

R-Y
MG
R
YL
B-Y
B
G
CY

CCD-FX630

Indicators in the Viewfinder

Warning Indicators

If indicators flash in the viewfinder or a caution lamp on the camcorder flashes, check the following:
♪ : you can hear the beep sound when the BEEP is set to ON.



1 The battery is weak or dead.
Slow flashing: The battery is weak.
Fast flashing: The battery is dead.

2 The tape is near the end.
The flashing is slow.

3 The tape has run out.
The flashing becomes rapid.

4 No tape has been inserted.

5 The tab on the tape is out (red).

6 Moisture condensation has occurred. (p. 39)

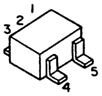
7 The video heads may be contaminated. (p. 40)

8 Some other trouble has occurred.
Disconnect the power source and contact your Sony dealer or local authorized facility.

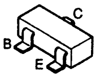
9 The lithium battery is weak or is not installed. (p. 34)

4-3. SEMICONDUCTORS

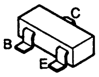
FP101
FP102



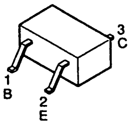
MSA1586
MSC4116



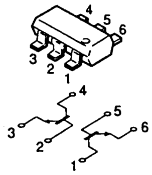
RN1302
UN511D
UN5113
UN5213
2SA1163
2SA1576
2SA1586
2SA812
2SB1218
2SB1462
2SB1295
2SC1623
2SC4081
2SC4116
2SC4154
2SC4178
2SC4400
2SD1819



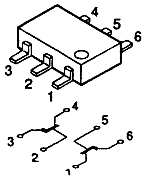
UN5111
UN5211



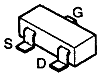
XN4213
XN4501


4
5
6
3
2
1
4
5
6
3
2
1

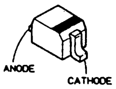
XN4401


4
5
6
3
2
1
4
5
6
3
2
1

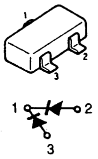
2SK1875



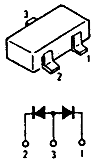
MA110
MA111
1SS352


ANODE
CATHODE

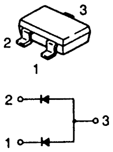
MA142WK



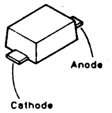
MA152WA



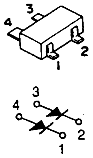
MA4Z082WA



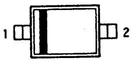
MA728


Anode
Cathode

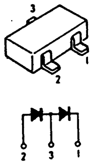
MA796



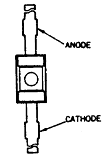
02Z13



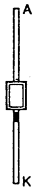
1SS123



LN1261CAL


ANODE
CATHODE

LN1371G



Ref. No.	Part No.	Description	Remark
*	A-7072-002-A	ZB-2 BOARD, COMPLETE ******************** (Ref. No. 4,000 Series)	
		< BUZZER >	
BU101	1-529-107-11	BUZZER, PIEZOELECTRIC	
		< CAPACITOR >	
C102	1-164-346-11	CERAMIC CHIP 1uF	16V
C103	1-164-346-11	CERAMIC CHIP 1uF	16V
		< CONNECTOR >	
CN101	1-691-483-21	CONNECTOR, FFC/FPC 4P	
		< BATTERY >	
LI101	1-550-104-11	HOLDER, BATTERY	

****

MISCELLANEOUS
****

Ref. No.	Part No.	Description	Remark
10	1-467-647-11	SWITCH BLOCK, CONTROL (F-VR)(FX630)	
117	1-467-648-11	SWITCH BLOCK, CONTROL (CK)(FX630)	
117	1-467-648-21	SWITCH BLOCK, CONTROL (CK) (FX430/FX435/FX530)	
⚠158	1-452-566-11	CRT ASSY (M01KKX07WB10)	
201	1-467-649-11	SWITCH BLOCK, CONTROL (FK) (FX430/FX435/FX630)	
201	1-467-649-21	SWITCH BLOCK, CONTROL (FK)(FX430)	
207	1-691-471-11	CONNECTOR, TRANSLATION 11P	
211	1-651-935-11	FP-95 FLEXIBLE BOARD (FX430/FX435/FX630)	
211	1-652-452-11	FP-166 FLEXIBLE BOARD (FX530)	
219	1-651-936-11	FP-96 FLEXIBLE BOARD(FX430/FX435/FX630)	
219	1-652-453-11	FP-176 FLEXIBLE BOARD (FX530)	
222	1-651-891-11	FP-52 FLEXIBLE BOARD	
253	1-547-716-11	LENS, ZOOM (VCL-5412WA)(TYPE II)	
253	8-848-704-01	DEVICE, LENS (LSV-140A)(TYPE I)	
254	1-651-904-11	FP-97 FLEXIBLE BOARD	
264	1-547-529-21	FILTER BLOCK, OPTICAL (FX630)	
264	1-547-558-21	FILTER BLOCK, OPTICAL (FX430/FX435/FX530)	
871	1-641-643-12	FP-444 FLEXIBLE BOARD	
872	1-691-254-13	CONNECTOR, TRANSLATION 10P	
IC691	A-7030-368-A	CCD BLOCK ASSY(AUTO)(054 SERVICE) (CCD IMAGER)(FX430/FX435/FX530)	
IC691	A-7030-373-A	CCD BLOCK ASSY(AUTO)(059V SERVICE) (CCD IMAGER)(FX630)	
J201	1-537-415-11	TERMINAL BOAD (FX530)	
J201	1-537-726-11	TERMINAL BOARD (FX430/FX435/FX630)	
M001	1-542-162-11	MICROHONE UNIT (FX430/FX435/FX630)	
M002	1-542-186-21	MICROPHONE UNIT (FX530)	
M003	1-542-186-21	MICROPHONE UNIT (FX530)	
M901	A-7048-564-A	DRUM ASSY (DGH-78A-R)	
M902	8-835-477-12	MOTOR, DC SCE-0101A (CAPSTAN)	
M903	A-7040-304-A	MOTOR BLOCK ASSY, LM (LOADING)	
M905	1-698-364-01	MOTOR ASSY, FOCUS (TYPE I)	
M906	1-698-363-01	MOTOR ASSY, ZOOM (TYPE I)	
M907	3-708-888-01	METER IG (TYPE II)	
M908	3-708-889-01	MOTOR ASSY, FOCUS (TYPE II)	
M909	3-708-887-01	MOTOR ASSY, ZOOM (TYPE II)	

****

ACCESSORIES & PACKING MATERIALS
****

Ref. No.	Part No.	Description	Remark
	1-467-574-21	REMOTE COMMANDER (RMT-708)	
	1-575-334-11	CORD (WITH CONNECTOR) (A/V connecting cable)(FX530)	
	3-738-517-01	BELT (S), SHOULDER	
	3-758-676-21	MANUAL, INSTRUCTION (ENGLISH)	
	3-758-676-31	MANUAL, INSTRUCTION (FRENCH)(FX630:CND)	
	3-896-108-01	BAG, PROTECTION (FX630:CND)	
*	3-958-570-01	INDIVIDUAL CARTON (FX630)	
*	3-958-570-11	INDIVIDUAL CARTON (FX430)	
*	3-958-570-21	INDIVIDUAL CARTON (FX530)	
*	3-958-570-31	INDIVIDUAL CARTON (FX435)	
*	3-958-571-01	CUSHION, LOWER	
*	3-958-572-01	CUSHION, ACC	
*	3-795-581-21	SAFEGUARD (SONY), IMPORTANT (FX430/FX435/FX530/FX630:US)	
	A-6768-253-A	RFU ADAPTOR (RFU-90UC)	
**	AC-V25/V25A	AC POWER ADAPTOR	
***	NP-55	BATTERY PACK	

Note.

** MARK PARTS IS AVAILABLE FOR REPAIR SERVICE.

*** MARK PARTS IS AVAILABLE AS AN OPTIONAL ACCESSORY.

****

****

HARDWARE LIST

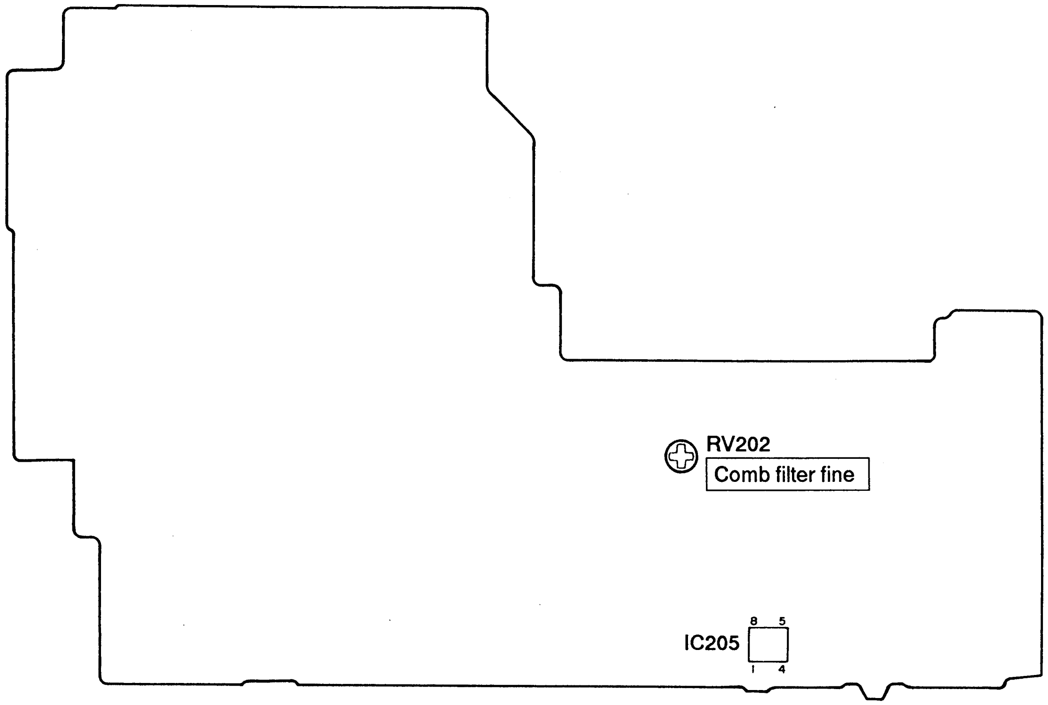
****

#1	7-627-553-47	PRECISION SCREW +P 2X4 TYPE 3

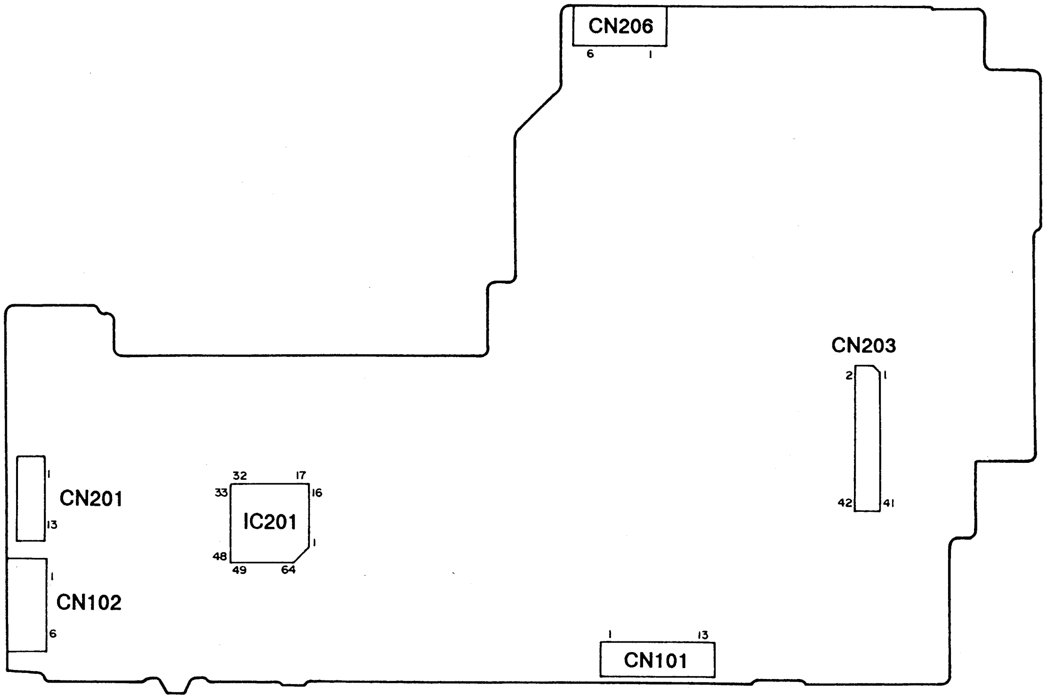
Be sure to read "Note on the CCD Imager replacement" on page 4-6 when changing the CCD imager.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

VS BOARD (COMPONENT SIDE)


RV202
Comb filter fine
IC205
8
5
1
4

VS BOARD (CONDUCTOR SIDE)


CN206
6
1
CN203
2
1
42
41
1
CN201
13
32
17
33
16
IC201
1
48
49
64
1
CN102
6
1
13
CN101

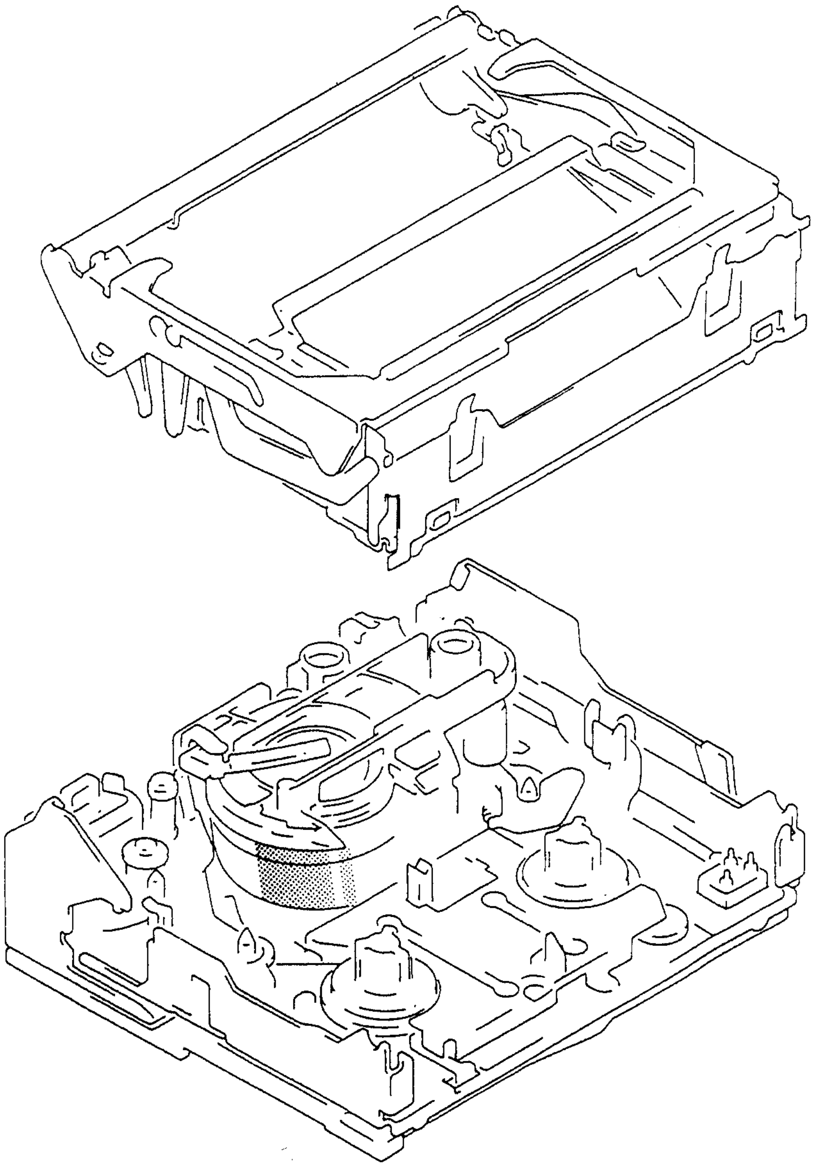
8 mm Video MECHANICAL ADJUSTMENT MANUAL IV

V12995

A MECHANISM

Video 8

File with the SERVICE MANUAL



8 VIDEO RECORDER

SONY®

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1. PREPARATION FOR MECHANICAL CHECK, ADJUSTMENT AND REPLACEMENT

For removal of the cabinet and boards, refer to "Disassembly" in each Service Manual.
Mechanical adjustment is done in the USE mode. (To select the USE mode, refer to "1-3, Handling of Mode Selector".)

1-1. CASSETTE COMPARTMENT ASSEMBLY

1. Removal (Fig. 1)

1) Select the USE mode.
2) Push the part ⓐ of lock arm ❶ toward the arrow 🅐 to unlock from lock guide ❷, and raise the cassette compartment as shown in Fig. a.
3) Remove two screws ❸ and remove the LS frame ❹ toward the arrow 🅑.
4) With the cassette compartment assembly ❺ pushed in arrow 🅒 direction, distort tabs ⓑ and ⓒ of MD side plate toward the arrow 🅓 to disengage from catches ⓓ and ⓔ of cassette compartment assembly respectively.
In such a case, insert a screwdriver between MD side plate and catch and disengage the tab ⓑ first, then disengage the tab ⓒ for easy removal as shown in Fig. b.
5) Raise the cassette compartment assembly ❺ in the opposite direction of arrow 🅒 until the shafts ⓕ and ⓖ are disengaged, and push left and right side plates toward arrow 🅓 to remove the cassette compartment assembly.

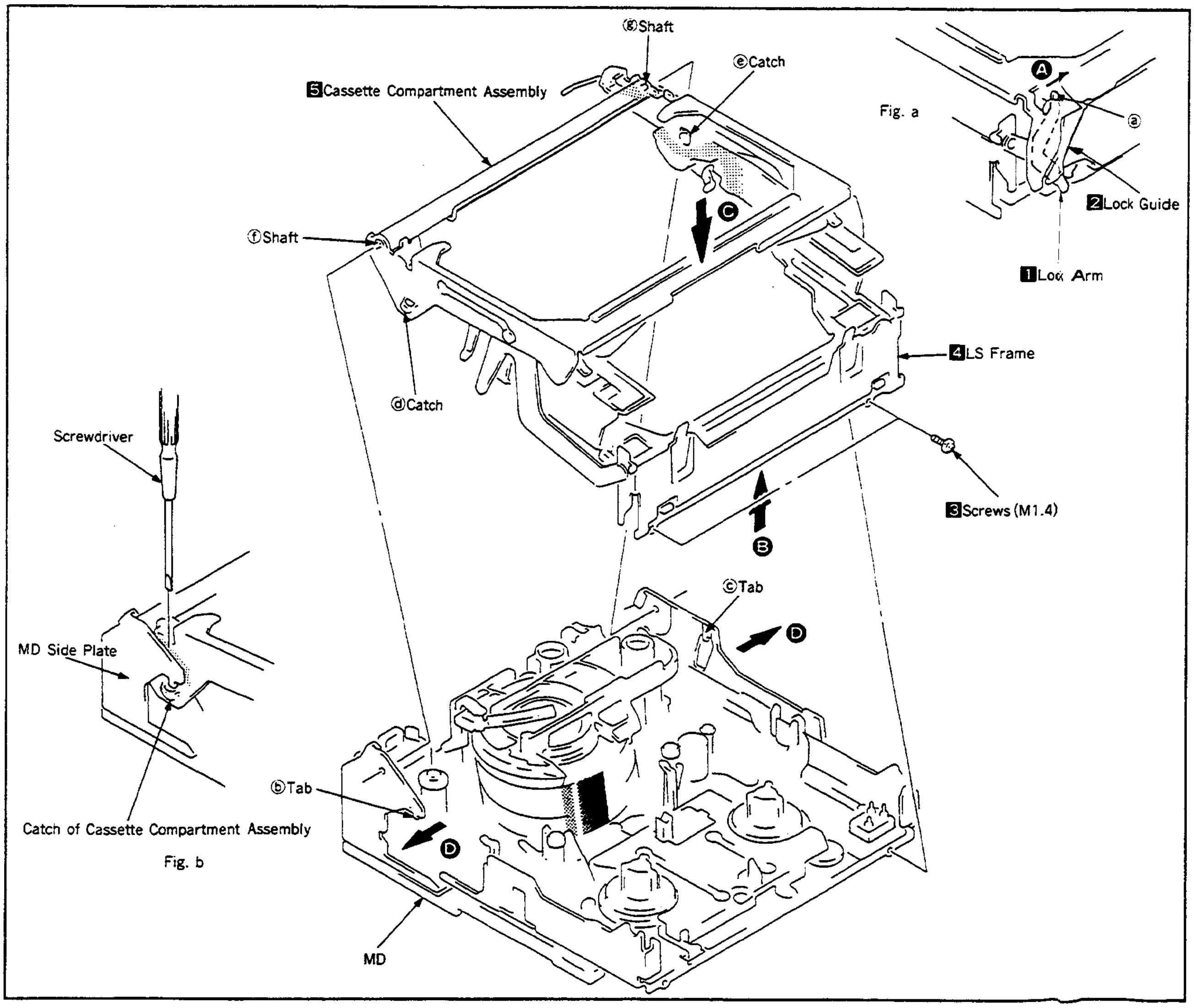

ⓖShaft
ⓔCatch
❺Cassette Compartment Assembly
Fig. a
🅐
ⓐ
❷Lock Guide
❶Lock Arm
ⓕShaft
🅒
❹LS Frame
ⓓCatch
Screwdriver
❸Screws (M1.4)
🅑
ⓒTab
🅓
MD Side Plate
ⓑTab
🅓
Catch of Cassette Compartment Assembly
Fig. b
MD

Fig. 1

2. Mounting (Fig. 2)

1) Select the USE mode.
2) Draw the cassette holder ❻ of cassette compartment assembly ❺ toward the arrow 🅔, and lower the LS frame ❹ toward the arrow 🅕.
3) With the cassette compartment assembly ❺ tilted by about 45° against MD, insert shafts ⓕ and ⓖ of cassette compartment assembly into holes ⓗ and ⓘ of MD side plate respectively.
   At this time, the part ⓙ of torsion bar must be positioned on the side ⓚ of LS flexible board (FP-443) (not on the side ⓛ), as shown in Fig. c.
4) Holding holes ⓗ and ⓘ of MD side plate, press the cassette compartment assembly ❺ so that its catches ⓓ and ⓔ are engaged with tabs ⓑ and ⓒ of MD side plate. In such a case, the lock arm ❶ of cassette compartment assembly must be inserted into a groove in the guide rail ❼ on the MD side plate as shown in Fig. d.
5) Insert left and right side plates ⓜ and ⓝ of LS frame ❹ inside the LS chassis ❽.
6) Push down the cassette compartment to lock.

Note : Make sure that the shafts ⓕ, ⓖ and the tabs ⓞ, ⓟ are set in the MD side plate properly.

7) Tighten two screws ❸.

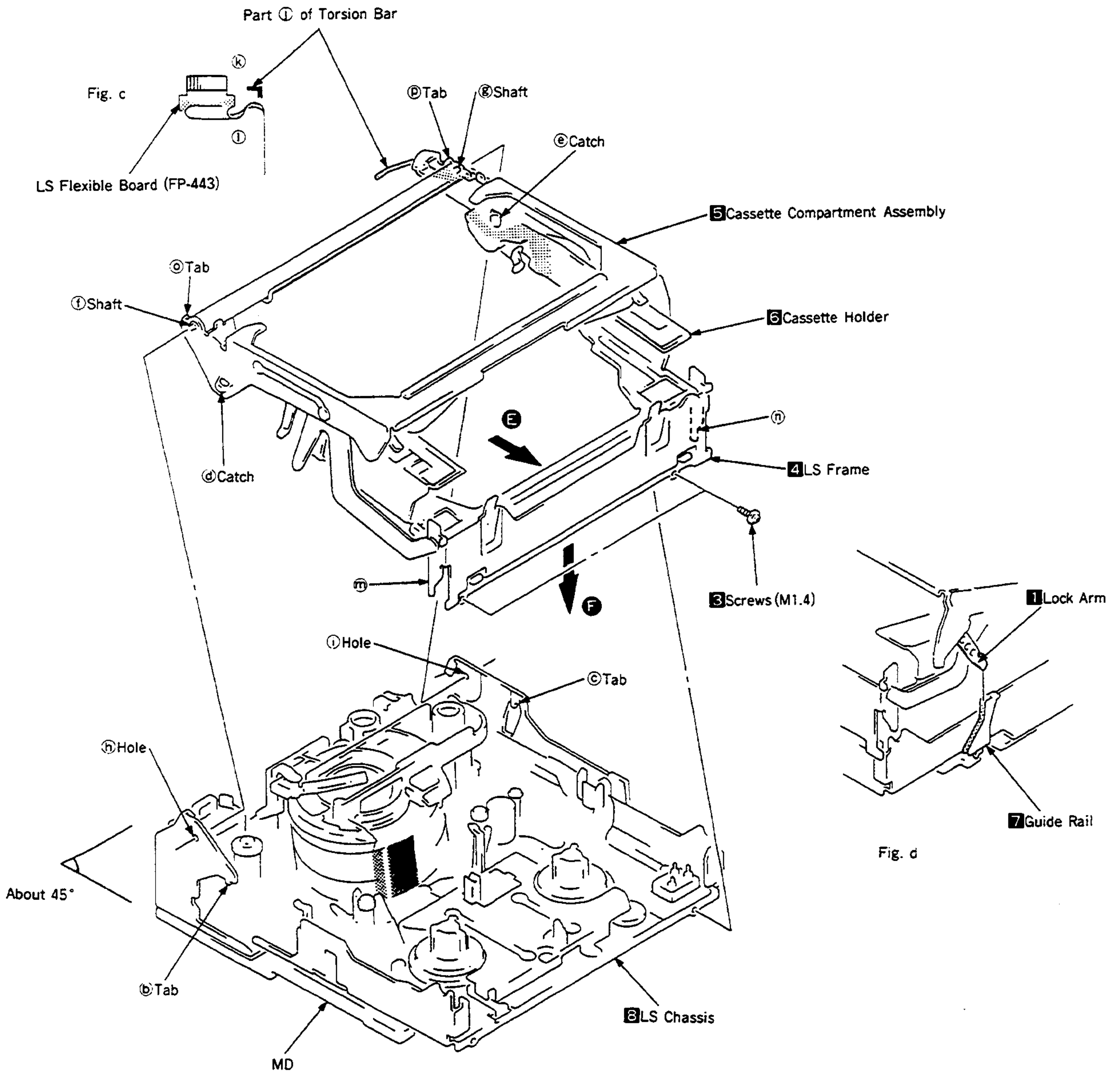

Part ⓙ of Torsion Bar
ⓚ
Fig. c
ⓛ
LS Flexible Board (FP-443)
ⓟTab
ⓖShaft
ⓔCatch
❺Cassette Compartment Assembly
ⓞTab
ⓕShaft
❻Cassette Holder
ⓝ
🅔
ⓓCatch
❹LS Frame
ⓜ
🅕
❸Screws (M1.4)
❶Lock Arm
ⓘHole
ⓒTab
ⓗHole
About 45°
ⓑTab
❽LS Chassis
MD
❼Guide Rail
Fig. d

Fig. 2

1-2. OPERATION WITH CASSETTE COMPARTMENT ASSEMBLY REMOVED (Fig. 3)

1) Referring to the Service Manual, supply power with the cabinet and camera removed. (Make the mechanical deck ready to operate.)
2) Place the cap 2 on the Reflector C 1.
3) Press the pin of the push switch 3 (ON state) and fix it with adhesive tape 4 in that state.

Note : Press the asterisked (✱) pin to set the REC mode.
(This is not required for the other modes.)

4) Push the cassette compartment DOWN switch 5 in an arrow direction as shown in Fig. a.

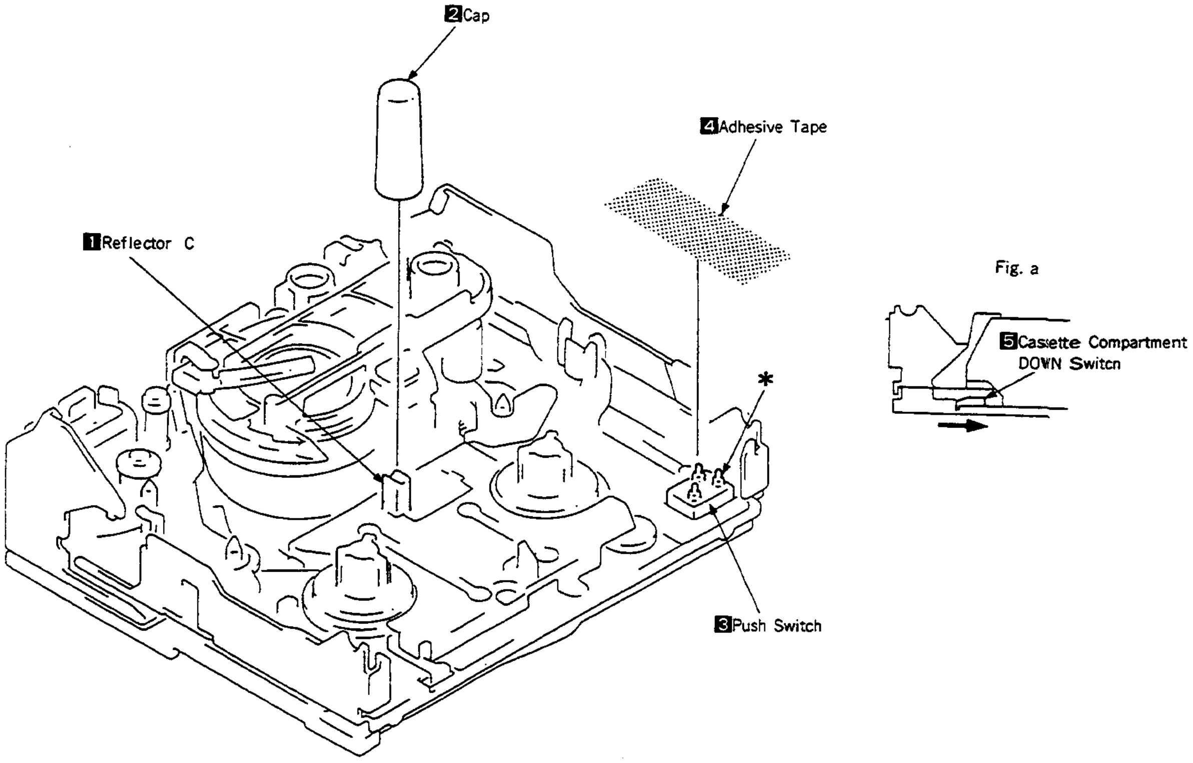

2 Cap
4 Adhesive Tape
1 Reflector C
Fig. a
5 Cassette Compartment DOWN Switch
*
3 Push Switch

Fig. 3

1-3. HANDLING OF MODE SELECTOR

- Stick the MD process table label to the mode selector IV panel, then mount the panel on the mode selector. U,U', FL, O, O' and A mechanisms have different mode indications respectively. Select your disired type. (Fig.4)

1 Construction (Fig.5)

2 Connection (Fig.6)

For CCD-FX410 series

1) Insert the FP-425 flexible connector **1** and M-SW connector **2** into the mode selector IV conversion connector **3** respectively.

3. Handling

1) Use the M mode selector buttons only.
2) During mode selection, "BLANK" lights up when no mode is being selected.
3) If the right M mode selector button is kept pressed, END, EJECT, USE, LOAD, READY,TURN, REC and FF light up in that order.
4) When changing over from the FF mode back to the END mode, press the left M mode selector botton to select your desired mode.

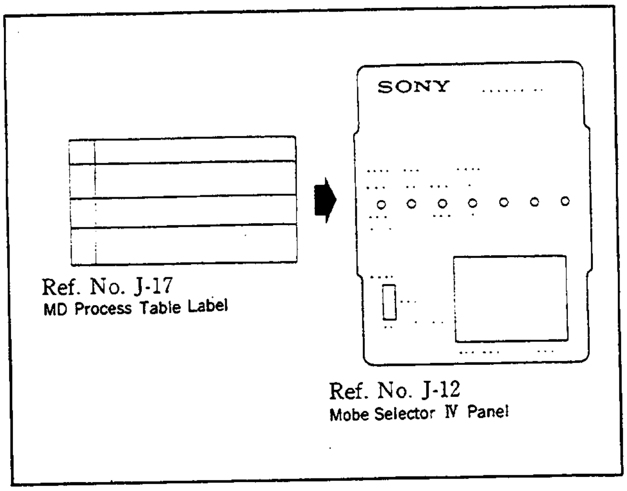

SONY
Ref. No. J-17
MD Process Table Label
Ref. No. J-12
Mobe Selector Ⅳ Panel

Fig. 4

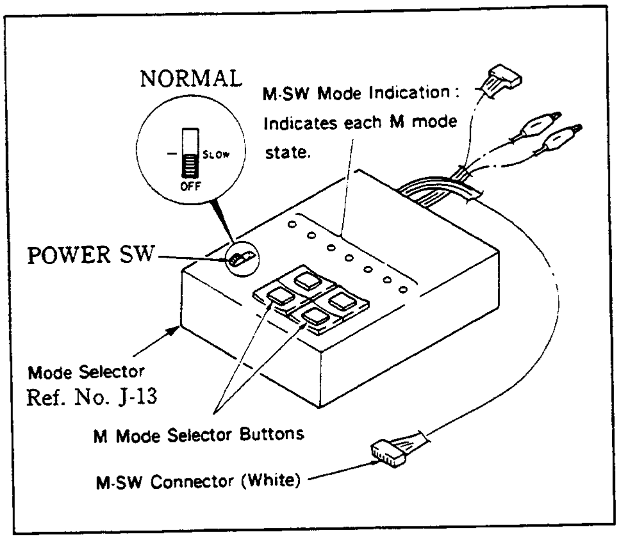

NORMAL
SLOW
OFF
M-SW Mode Indication : Indicates each M mode state.
POWER SW
Mode Selector
Ref. No. J-13
M Mode Selector Buttons
M-SW Connector (White)

Fig. 5

For CCD-FX410 series

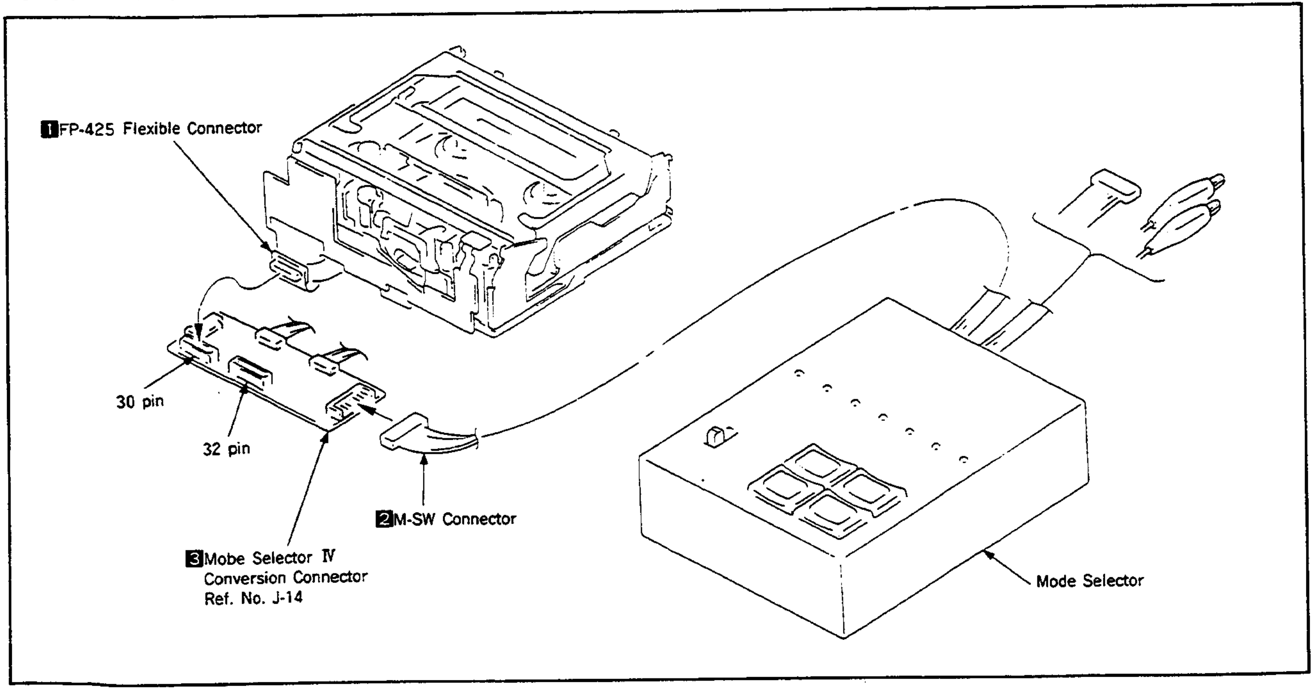
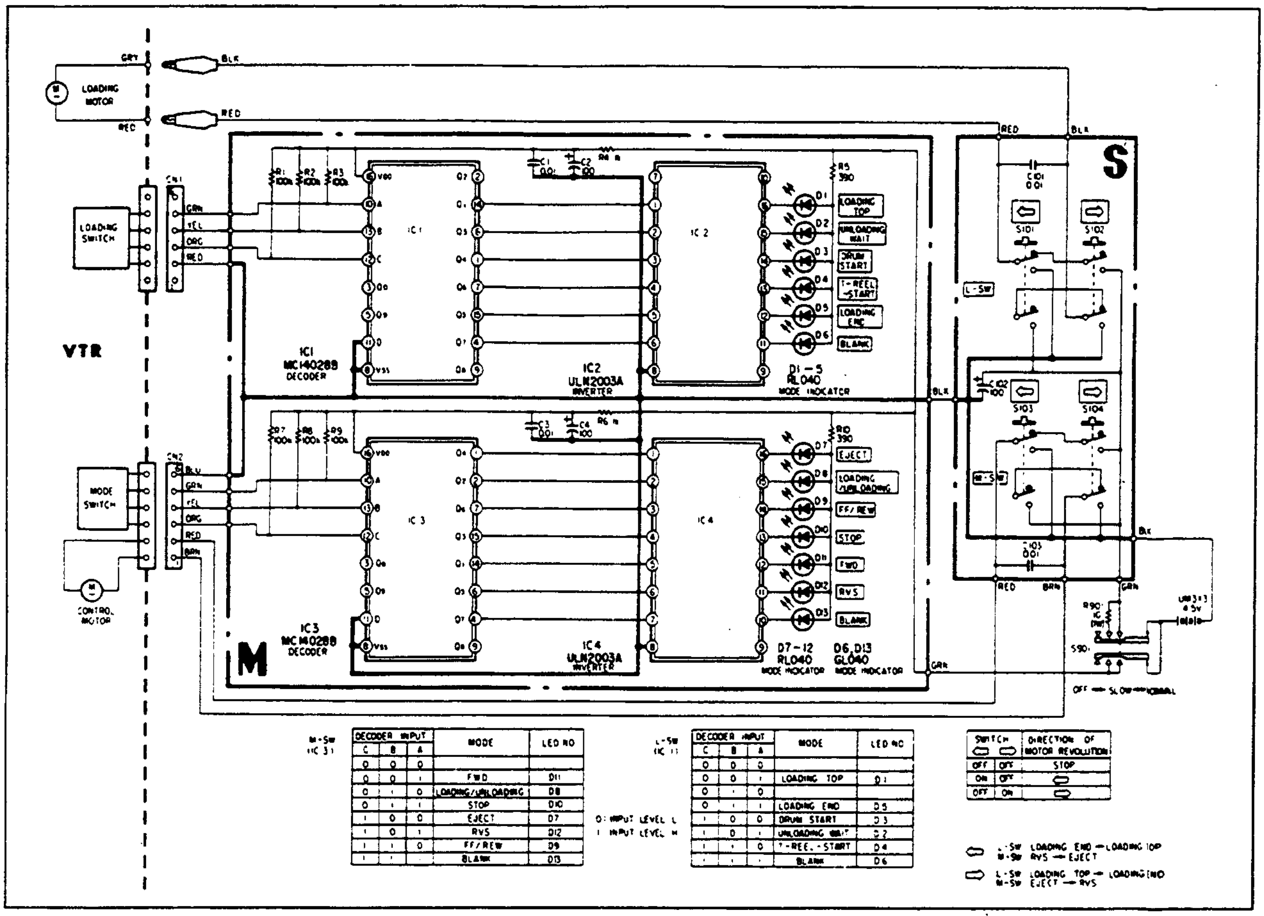

1 FP-425 Flexible Connector
30 pin
32 pin
2 M-SW Connector
3 Mobe Selector Ⅳ Conversion Connector Ref. No. J-14
Mode Selector

Fig. 6

1-4. MODE SELECTOR SCHEMATIC DIAGRAM


GRY
BLK
LOADING MOTOR
RED
LOADING SWITCH
CN1
GRN
YEL
ORG
RED
VTR
MODE SWITCH
CN2
BLU
GRN
YEL
ORG
RED
BRN
CONTROL MOTOR
IC1
MC14028B
DECODER
IC2
ULN2003A
INVERTER
IC3
MC14028B
DECODER
IC4
ULN2003A
INVERTER
D1 – 5
RL040
MODE INDICATOR
D7 – 12
RL040
MODE INDICATOR
D6, D13
GL040
MODE INDICATOR
LOADING TOP
UNLOADING WAIT
DRUM START
T-REEL START
LOADING END
BLANK
EJECT
LOADING /UNLOADING
FF/REW
STOP
FWD
RVS
BLANK
S
M
S101
S102
S103
S104
L-SW
M-SW
R901
S901
OFF — SLOW — NORMAL

M-SW (IC 3)

DECODER INPUT			MODE	LED NO
C	B	A		
0	0	0		
0	0	1	FWD	D11
0	1	0	LOADING/UNLOADING	D8
0	1	1	STOP	D10
1	0	0	EJECT	D7
1	0	1	RVS	D12
1	1	0	FF/REW	D9
1	1	1	BLANK	D13

0 : INPUT LEVEL L
1 : INPUT LEVEL H

L-SW (IC 1)

DECODER INPUT			MODE	LED NO
C	B	A		
0	0	0		
0	0	1	LOADING TOP	D1
0	1	0		
0	1	1	LOADING END	D5
1	0	0	DRUM START	D3
1	0	1	UNLOADING WAIT	D2
1	1	0	T-REEL-START	D4
1	1	1	BLANK	D6

SWITCH		DIRECTION OF MOTOR REVOLUTION
⇦	⇨	
OFF	OFF	STOP
ON	OFF	⇦
OFF	ON	⇨

⇦ L-SW LOADING END → LOADING TOP
M-SW RVS → EJECT

⇨ L-SW LOADING TOP → LOADING END
M-SW EJECT → RVS

1-5. MODE SELECTOR PARTS LIST

Ref. No	Part No.	Description		
		CAPACITOR		
C1	1-108-579-00	MILER	0.01μF	50V
C2	1-123-333-00	ELECT	100μF	24V
C3	1-108-579-00	MILER	0.01μF	50V
C4	1-123-333-00	ELECT	100μF	24V
C101	1-108-579-00	MILER	0.01μF	50V
C102	1-123-333-00	ELECT	100μF	24V
C103	1-108-579-00	MILER	0.01μF	50V
		DIODE		
D1	8-719-812-31	DIODE TLR123		
D2	8-719-812-31	DIODE TLR123		
D3	8-719-812-31	DIODE TLR123		
D4	8-719-812-31	DIODE TLR123		
D5	8-719-812-31	DIODE TLR123		
D6	8-719-812-33	DIODE TLG123A		
D7	8-719-812-31	DIODE TLR123		
D8	8-719-812-31	DIODE TLR123		
D9	8-719-812-31	DIODE TLR123		
D10	8-719-812-31	DIODE TLR123		
D11	8-719-812-31	DIODE TLR123		
D12	8-719-812-31	DIODE TLR123		
D13	8-719-812-33	DIODE TLG123A		

Ref. No	Part No.	Description		
		IC		
IC1	8-752-240-28	IC	TC4028BP	
IC2	8-752-120-03	IC	μPA2003C	
IC3	8-759-240-28	IC	TC4028BP	
IC4	8-759-120-03	IC	μPA2003C	
		RESISTOR		
R1	1-247-179-00	CARBON	100K	1/4W
R2	1-247-179-00	CARBON	100K	1/4W
R3	1-247-179-00	CARBON	100K	1/4W
R4	1-247-131-00	CARBON	1K	1/4W
R5	1-247-121-00	CARBON	390	1/4W
R6	1-247-131-00	CARBON	1K	1/4W
R7	1-247-179-00	CARBON	100K	1/4W
R8	1-247-179-00	CARBON	100K	1/4W
R9	1-247-179-00	CARBON	100K	1/4W
R10	1-247-121-00	CARBON	390	1/4W
R901	1-214-594-00	METAL	10	1W

2. PERIODIC CHECK AND MAINTENANCE

- Carry out the following maintenance and periodic checks in order not only to fully exhibit the functions and performance of the set, but also for the equipment and tape. After repairing, service the set as follows, regarless of the length of use.

2-1. CLEANING OF ROTARY DRUM ASSEMBLY

1) Gently apply chamois cloth (Ref. No. J-2) soaked in cleaning liquif (Ref. No.J-1) to the rotary drum assembly.
   Clean it by rotating the upper rotary drum assembly slowly counterclockwise by hand.

Note : Do not rotate the motor by power or rotate the upper rotary drum assembly clockwise by hand. Also, the head tip is highly likely to be damaged if the chamois cloth is moved in a pependicular direction to the it. make sure to follow the instructions above for cleaning the rotarydrum assembly.

2-2. CLEANING OF TAPE PATH (Fig.7)

1) In the USE mode, clean the tape running system (TG - 1,- 2,- 3,- 4,- 5, - 6, - 7, pinch roller, and capstan shaft) and the lower drum, using a super fine applicator (Ref. No. J - 3) soaked in the cleaning liquid.

Note : Note that no oil or grease of each link mechanism adheres to the super fine applicator (Ref. No. J - 3).

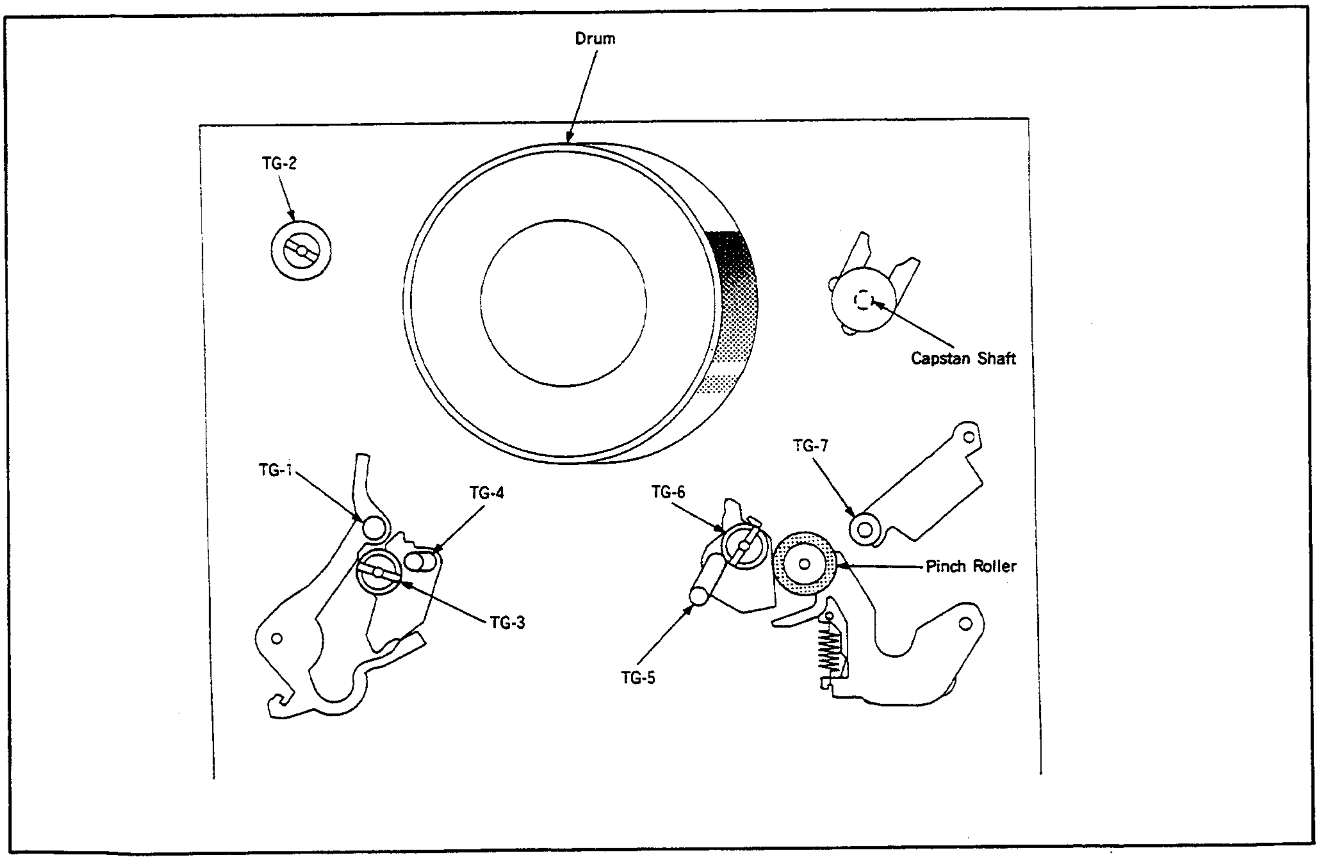


Fig. 7

2-3. PERILDIC CHECK ITEMS

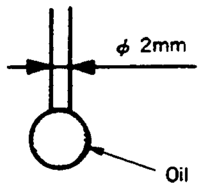
	Location of Maintenance and check	Hours of Use (H)										Remarks
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	
Tape trans-portion System	Cleaning of tape path surface	○	○	○	○	○	○	○	○	○	○	Be careful of oil
	Cleaning and degaussing of rotary assembly	○	○	○	○	○	○	○	○	○	○	Be careful of oil
Driving System	Relay belt	—	☆	—	☆	—	☆	—	☆	—	☆	3-944-539-01
	Capstan shaft	—	◎	—	◎	—	◎	—	◎	—	◎	Be adsolutely careful not to get oil on the tape path surface.
	Relay pulley shaft	—	◎	—	◎	—	◎	—	◎	—	◎	
	Loading motor	—	☆	—	☆	—	☆	—	☆	—	☆	A-7040-304-A
Performance Confirmation	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	—	☆	—	☆	—	☆	—	☆	—	☆	
	Brake system	—	☆	—	☆	—	☆	—	☆	—	☆	
	FWD. RVS torque measurement	—	☆	—	☆	—	☆	—	☆	—	☆	

○ : Cleaning　◎ : Oil　☆ : Confirmation

Note : When overhauling, refer to the items above to replace parts.

Note : Concerning oil

- Be sure to use specified oil. (If you use oil with different visicosity, etc., it may cause troubles.)
  Oil : Part No. 7-661-018-18 (Mitsubishi Diamond Oil Hydrofluid NT - 68)
- When lubricating bearings, be sure use oil free from dust, etc. (If you use oil with dust, etc. contained, it may cause bearings to be worn out or seized.)
- A drip of oil refers to an amount attached to the tip of a ϕ 2mm stick shown in the right figure.

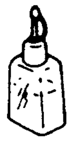


2-4. Service jigs list

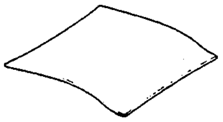
Ref. No.	Name	Part No.	Fixture No.	Usage and Others
J-1	Cleaning fluid	Y-2031-001-0		
J-2	Chamois cloth	2-034-697-00		
J-3	Super fine applicator (Made by NIPPON APPLICATOR, P752D)			
J-4	Head degausser	Widely available		
J-5	Small mirror for adjustment Spare mirror	J-6080-029-A J-6080-030-1	SL-5052	Tape path
J-6	Alignment tape NTSC (WR5-1N) PAL (WR5-1C)	8-967-995-01 8-967-995-06		Tape path
J-9	FWD and RVS winding torque cassette	J-6080-824-A	GD-2086	
J-10	Rotary drum jig	(Attached to the maintenance rotary upper drum)		
J-11	Screwdriver for tape path	J-6082-026-A		For tape guide adjustment
J-12	Mode selector Ⅳ panel	J-6082-105-A		
J-13	Mode selector	J-6080-825-A		For all models
J-14	Mode selector Ⅳ conversion connector	J-6082-167-A		
J-15	FWD B.T. adjusting driver	J-6082-182-A		
J-16	Adjusting remote controller	J-6082-053-B		Tape path (Setting of PATH mode)
J-17	MD process table label	J-6082-166-A		

Other equipment
- Oscilloscope
- Analog tester (20 kΩ)

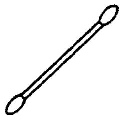
J-1



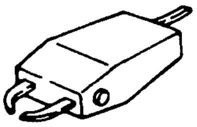
J-2



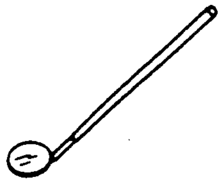
J-3



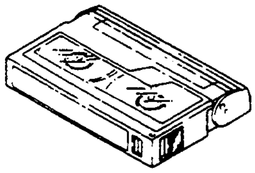
J-4



J-5



J-6



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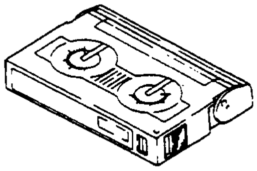
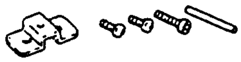
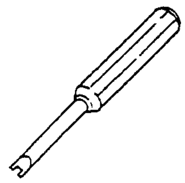


J-10

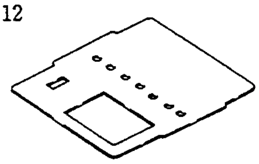


(Attached to the maintenance rotary upper drum)

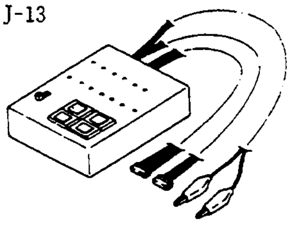
J-11



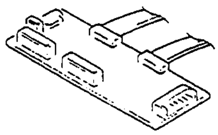
J-12



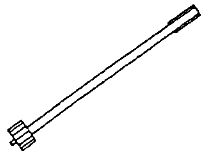
J-13



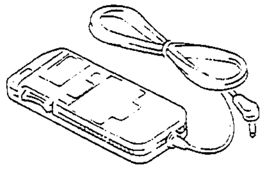
J-14



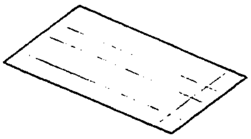
J-15



J-16



J-17



3. MECHANICAL CHECK, ADJUSTMENT AND REPLACEMENT

Note : Use the mode selector (Ref. No. J-13) for the following mechanical checks, adjustments and replacements.

Note : The modes in ☐ are those set by pressing the mode selector buttons.

3-1. RETAINER, GOOSENECK ASSEMBLY (Fig. 8)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Remove a screw **1**.
3) Remove the Retainer, Gooseneck assembly **2**.

2. Mounting

1) Mount the Retainer, Gooseneck assembly **2** with its two tabs and holes of LS chassis engaged with its hole and a boss of LS chassis.
2) Tighten the screw **1**.
3) Referring to 1-1, mount the cassette compartment assembly.

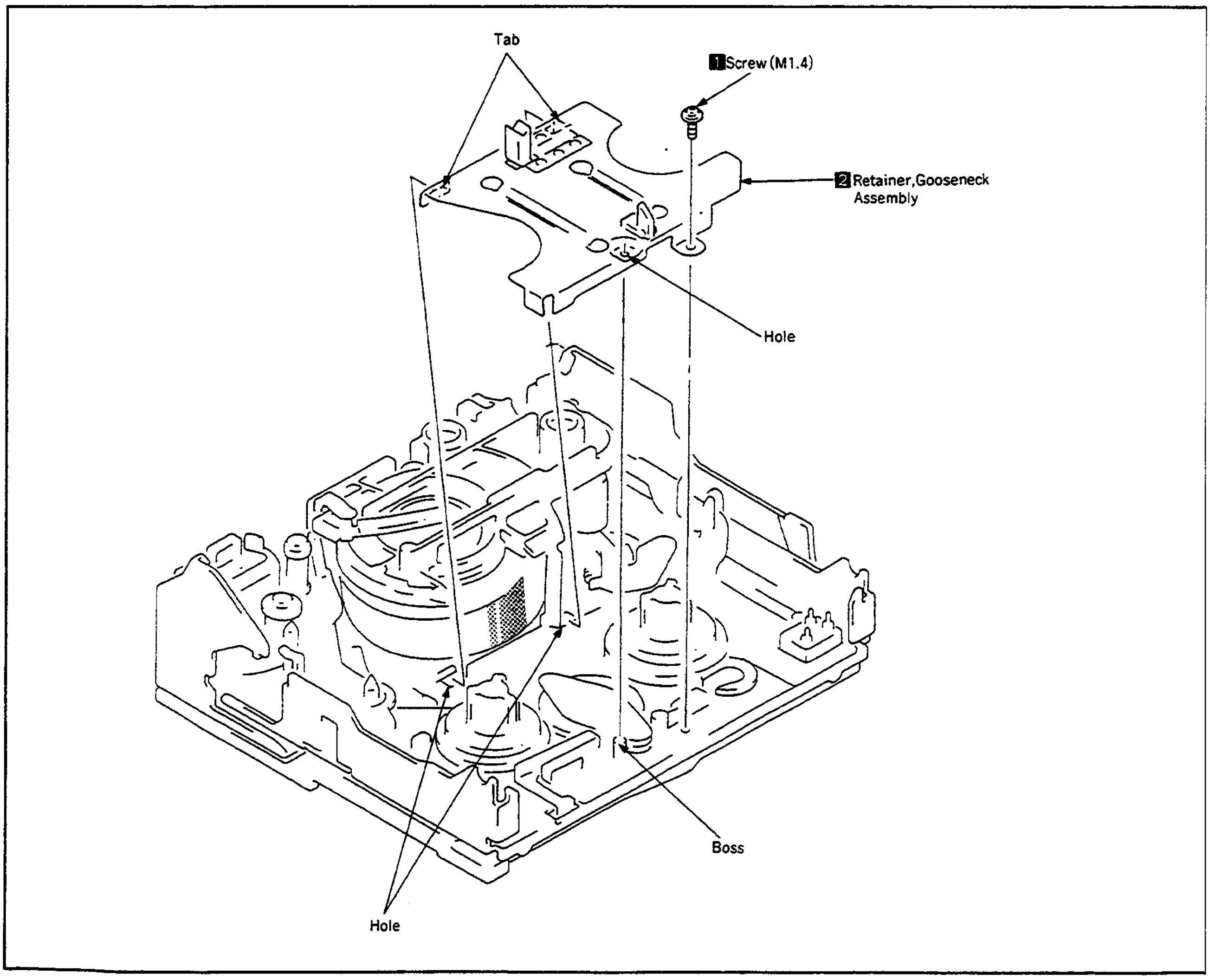


Fig. 8

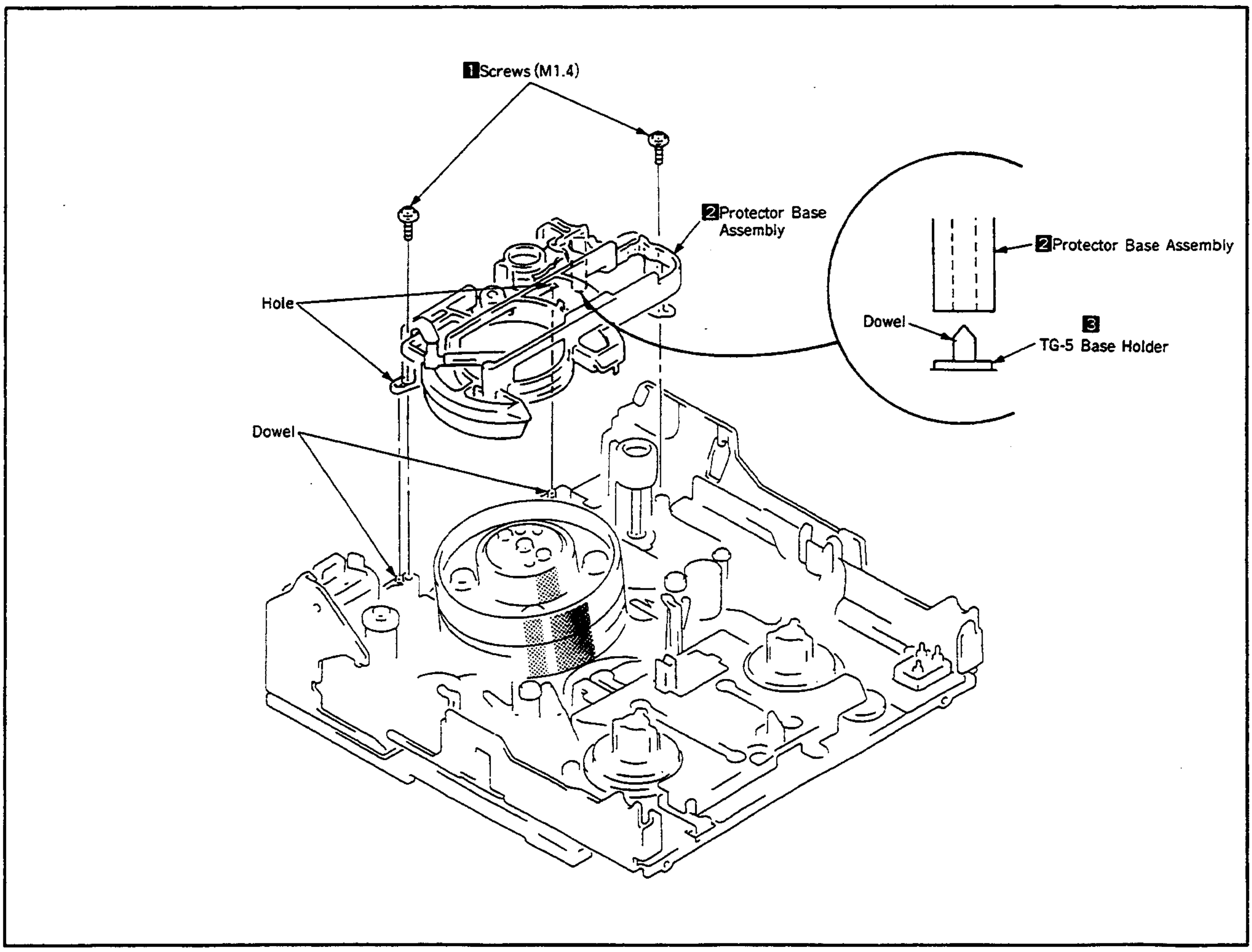
3-2. PROTECTOR BASE ASSEMBLY (Fig. 9)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Remove two screws ❶, then the protector base assembly ❷.

2. Mounting

1) Mount the protector base assembly ❷ with its three hole engaged with two dowels of mechanical chassis, and a dowel of TG-5 Base Holder ❸.
2) Tighten two screws ❶.
3) Referring to 1-1, mount the cassette compartment assembly.



❶Screws (M1.4)
❷Protector Base Assembly
Hole
Dowel
❷Protector Base Assembly
Dowel
❸
TG-5 Base Holder

Fig. 9

3-3. DRUM ASSEMBLY (Fig. 10)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-2, remove the protect base assembly.
3) Disconnect the connector of FP-444 flexible board ❶ on the back of MD.
4) Remove three screw ❷, then the drum assembly ❸.

Note : Do not touch the outer surfaced of drum (hold portions 🅐 and 🅑 of drum).

2. Mounting

1) Mount the drum assembly ❸ while aligning with two dowels ⓐ of chassis.

Note : Do not touch the outer surfaced of drum (hold portions 🅐 and 🅑 of drum).

2) Tighten three screw assemblies ❷ in the order of 1, 2 and 3.

Note : Tighten lightly not to deform the drum lead.

3) Apply a screw locking agent to prevent screws ftom loosening.

Note : In tightening the screws, pushing down the drum extremely will allow the drum to float up.

4) Connect the connector of FP-444 flexible board ❶ on the back of MD.
5) Referring to 3-2, mount the protect base assembly.
6) Referring to 1-1, mount the cassette compartment assembly.

Note : After mounting, make tape path adjustment in Section 4.

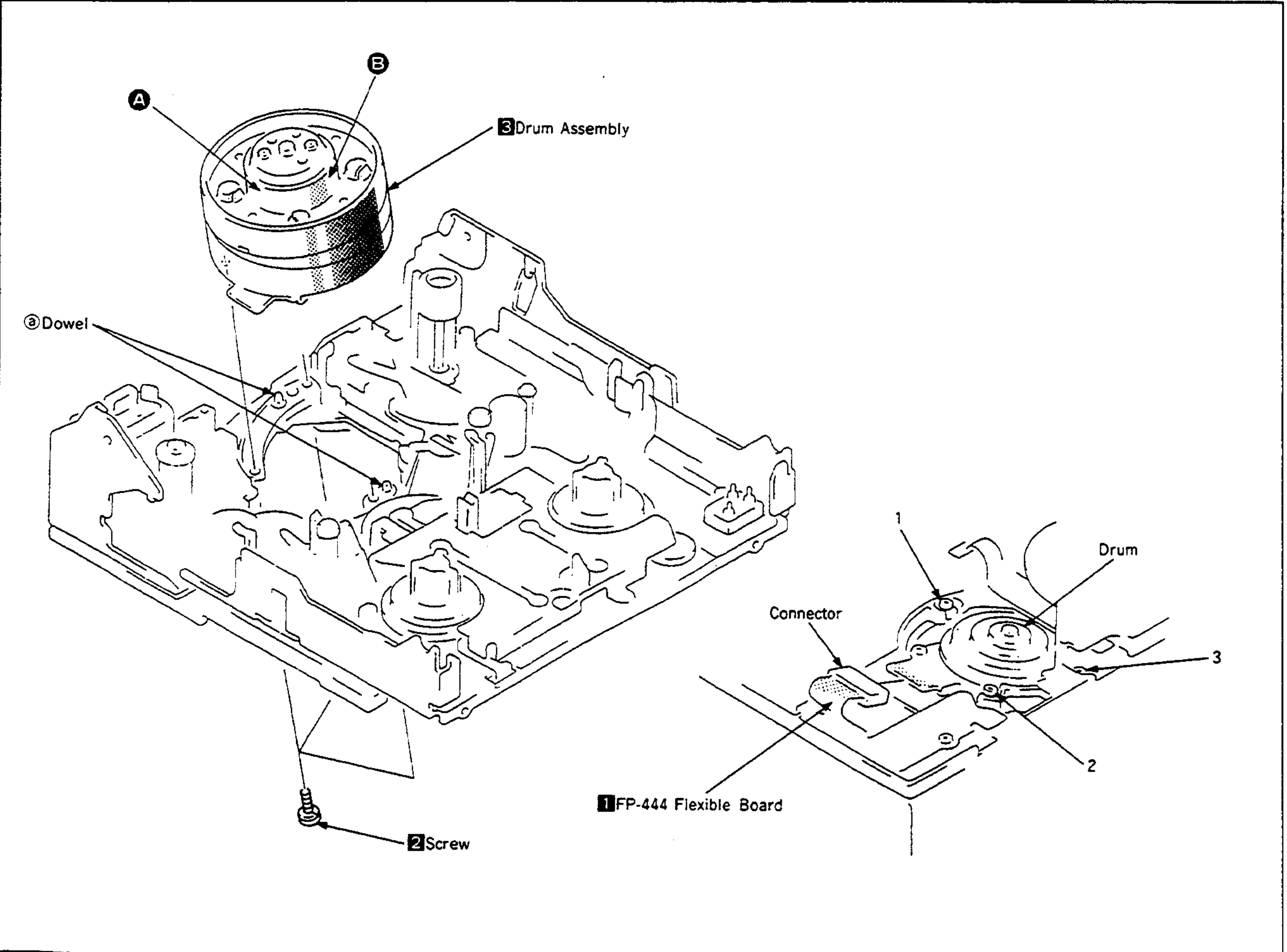


Fig. 10

3-4. CAPSTAN MOTOR ASSEMBLY (Fig. 11)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Remove two screw ❶, then the capstan cover ❷.
3) Remove the screw ❸, then the capstan motor assembly ❹.

2. Mounting

1) Mount the capstan motor assembly ❹ and tighten the scre ❸.

Note : In mounting the capstan motor assembly, hold lightly the capstan motor assembly until the rotor gear aligns with the change gear Assy, then insert fully the assembly when both gears are engaged completely by manually rotating the rotor. (Take care not to damage the change gear Assy.)

2) Mount the capstan cover ❷ and tighten two screws ❶.
3) Referring to 1-1, mount the cassette compartment assembly.

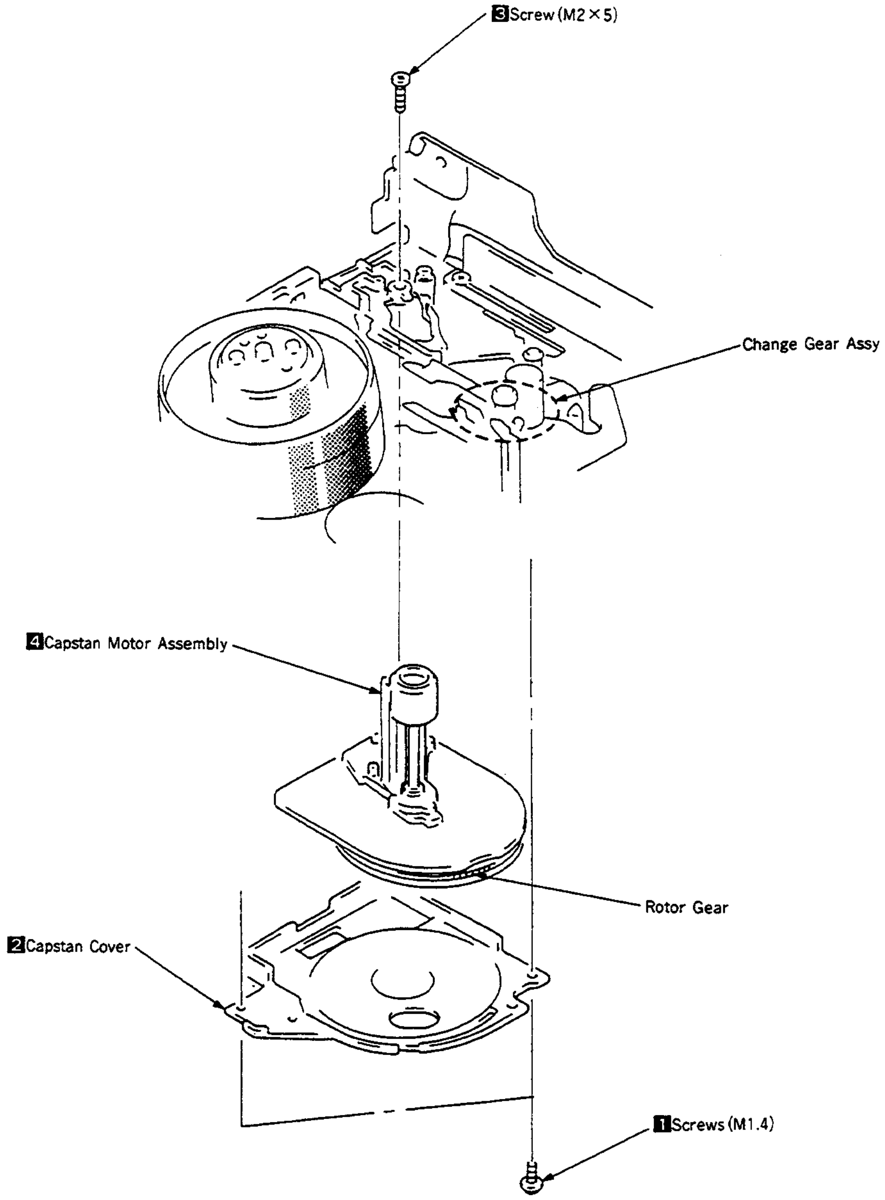

❸Screw (M2 × 5)
Change Gear Assy
❹Capstan Motor Assembly
Rotor Gear
❷Capstan Cover
❶Screws (M1.4)

Fig. 11

3-5. TAKE-UP REEL TABLE ASSEMBLY AND T- SOFT ASSEMBLY (Fig. 12)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Remove the take-up reel table assembly **1**.
4) Remove the T soft assembly **2**, then the T soft arm **3**.

2. Mounting

1) Mount the T soft arm **3** with its long hole ⓒ engaged with the boss ⓓ of LS chassis.
2) Mount the T soft assembly **2** with its tab ⓐ engaged with a square hole ⓑ of T soft arm, as shown in Fig. a.
3) Mount the take-up reel table assembly **1** and rotate it toward the arrow Ⓐ to be latched with T hard claw.
4) Referring to 3-1. mount the Retainer, Gooseneck assembly.
5) Referring to 1-1, mount the cassette compartment assembly.

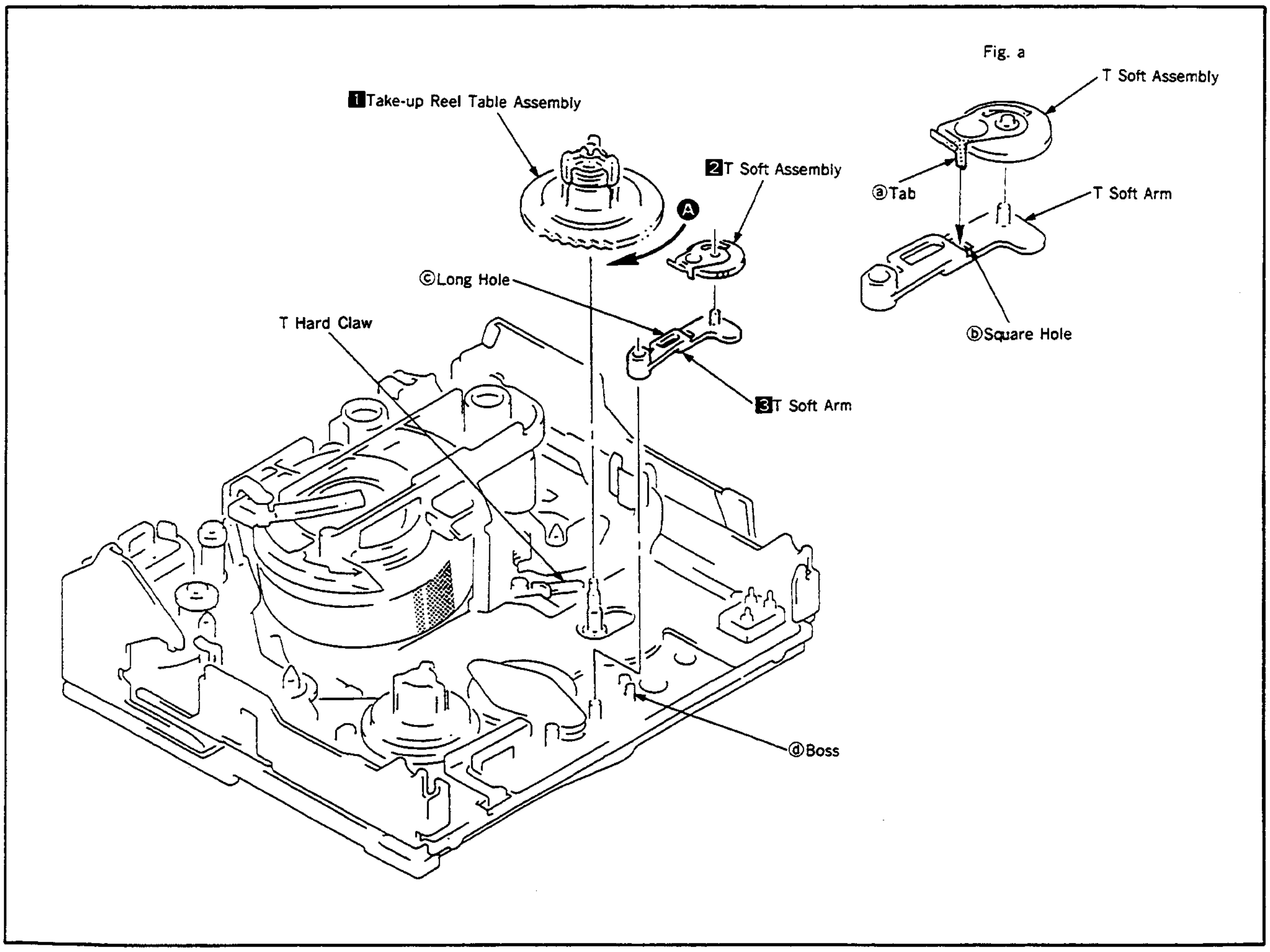


Fig. a
T Soft Assembly
ⓐTab
T Soft Arm
ⓑSquare Hole
1Take-up Reel Table Assembly
2T Soft Assembly
Ⓐ
ⓒLong Hole
T Hard Claw
3T Soft Arm
ⓓBoss

Fig. 12

3-6. PINCH ARM ASSEMBLY (Fig. 13)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Select the $\boxed{\text{READY}}$ mode.
3) Remove a washer ❶, then the pinch arm assembly ❷.

2. Mounting

1) Select the $\boxed{\text{READY}}$ mode.
2) Hooking a spring of pinch arm assembly ❷ to the casse positioning boss on the chassis, mount the pinch arm asser bly on the shaft of LS chassis assembly as shown in Fig. a.
3) Push in the spring with tweezers up to the root of boss as shown in Fig. b.
4) Mount the washer ❶.
5) Referring to 1-1, mount the cassette compartment assembly.

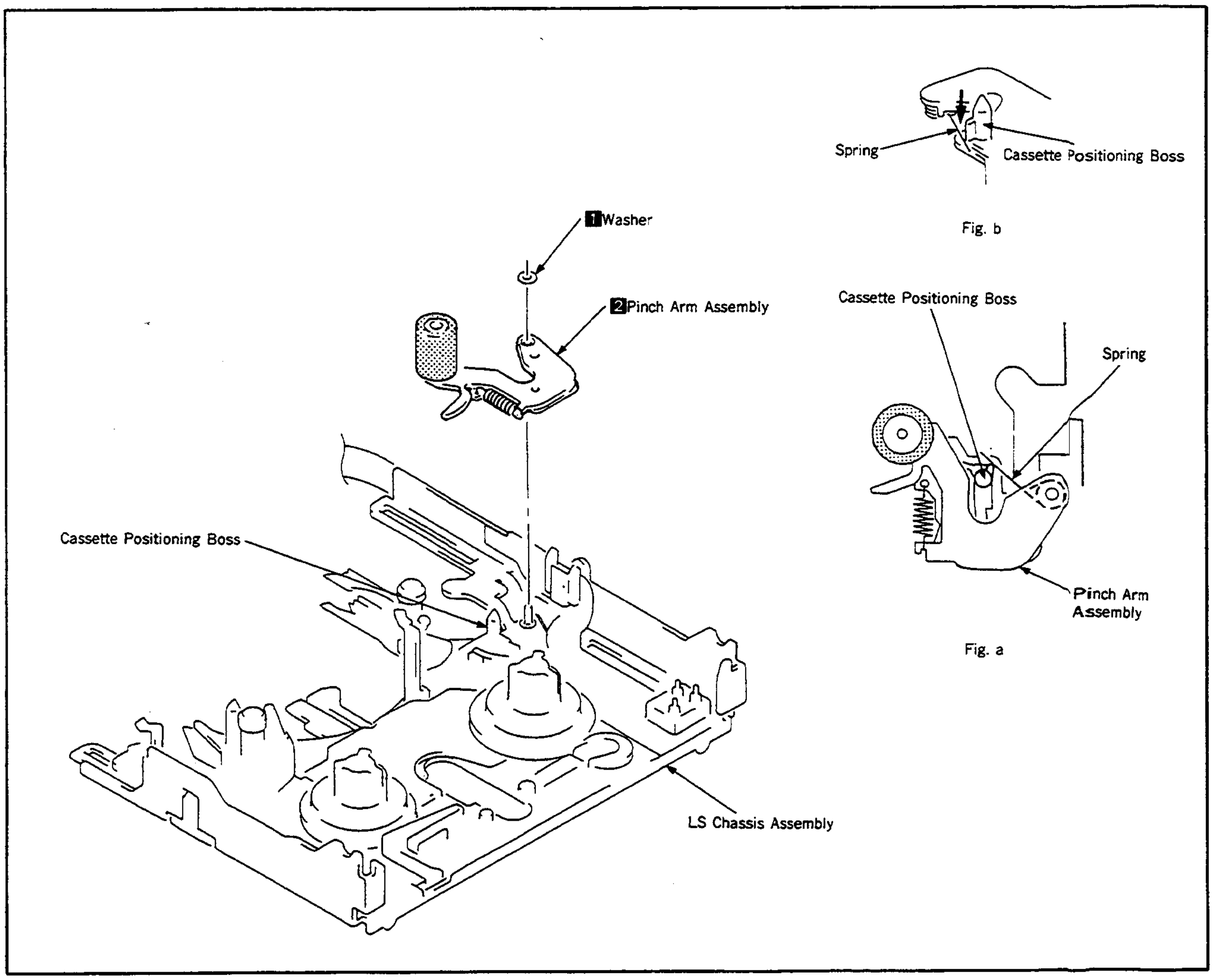

Spring
Cassette Positioning Boss
❶Washer
❷Pinch Arm Assembly
Cassette Positioning Boss
Spring
Cassette Positioning Boss
Pinch Arm Assembly
LS Chassis Assembly

Fig. b

Fig. a

Fig. 13

LS CHASSIS ASSEMBLY (Fig. 14)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Remove a screw ❶, TG-5 base holder ❷, and LS flexible board ❸.
5) Remove a lock washer ❹, then the gooseneck as sembly ❺.
6) Remove four screws ❻, then the LS chassis assembly ❼.

2. Mounting

1) Select the USE mode.
2) Confirm that the T hard claw and the outsert on the back of LS chassis are positioned as shown in Fig. a. (The T hard claw must be higher than corner ⓐ of chassis hole.) If not high, turn the outsert in the arrow direction while pushing the T hard claw from LS chassis to the chassis.
3) Sliding the GL slider, align the top edge of long hole ⓑ in GL slider with the edge face ⓒ of LS chassis hole as shown in Fig. b.
4) Mount the LS chassis assembly ❼ on the chassis.

Note : At this time, aligh a dowel ⓓ on LS chassis with a long hole ⓔ of No.7 guide on chassis, a long hole of GL slider with a GL arm pin, a groove of LS cam plate with an LS arm pin respectively as shown in Fig. c and d.

5) Tighten four screws ❻.
6) Mount the LS flexible board ❸ and TG-5 base holder ❷,then tighten the screw ❶.
7) Mount the Gooseneck assembly ❺ and fix it with a washer ❹.

Note : Using the mode selector, confirm that loading and unloading are performed smoothly.

8) Referring to 3-2, mount the protector base assembly.
9) Referring to 3-1, mount the Retainer, Gooseneck assembly.
10) Referring to 1-1, mount the cassette compartment assembly.

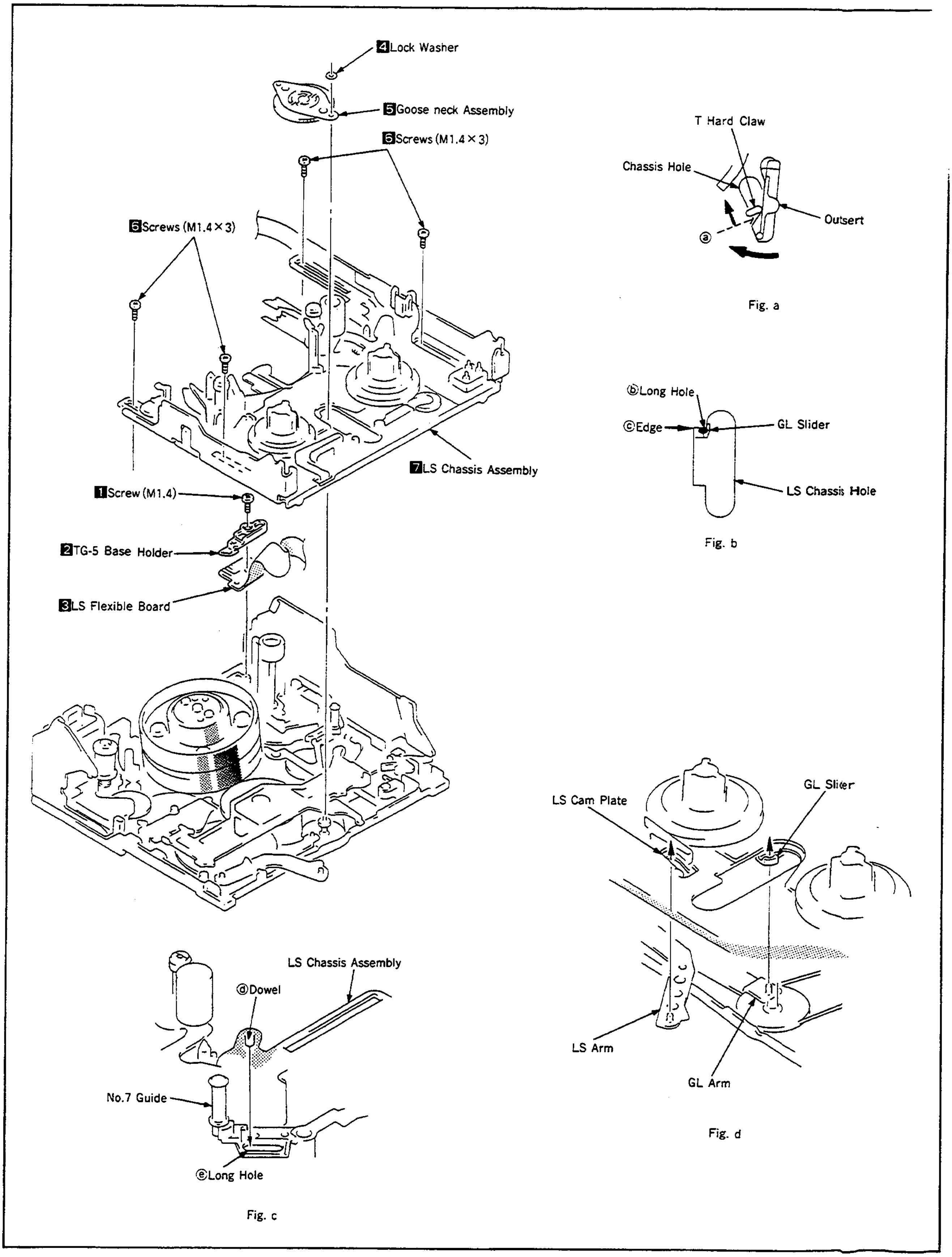

4 Lock Washer
5 Goose neck Assembly
6 Screws (M1.4×3)
6 Screws (M1.4×3)
7 LS Chassis Assembly
1 Screw (M1.4)
2 TG-5 Base Holder
3 LS Flexible Board
T Hard Claw
Chassis Hole
Outsert
ⓐ
ⓑ Long Hole
ⓒ Edge
GL Slider
LS Chassis Hole
LS Chassis Assembly
ⓓ Dowel
No.7 Guide
ⓔ Long Hole
LS Cam Plate
GL Slicer
LS Arm
GL Arm

Fig. a

Fig. b

Fig. c

Fig. d

Fig. 14

3- GUIDE BASE T ASSEMBLY AND GUIDE BASE S ASSEMBLY (Fig. 15, 16)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Push in the GL slider ❶ toward the arrow 🅐, and remove the guide base T assembly ❷ and guide base S assembly ❸ from the guide rail respectively as shown in Fig. 15.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T sofr assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assembly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

6) Turning the guide base T assembly ❷ and guide base S assembly ❸ respectively, align the shaft to hole to remove as shown in Fig. a.

2. Mounting

1) Turning the guide base T assembly ❷ and guide base S assembly ❸ respectively, align the shaft with a hole to mount as shown in Fig. a (Fig. 15).
2) On the back side of chassis, insert the guide arm T assembly ❹, guide arm S assembly ❺ and GL slider ❶ from position shown in Fig.b to position shown in Fig. c. Also, aligning the guide base T assembly ❷ and guide base S assembly ❸ with the respective guide rails, push in the GL slider ❶ toward the arrow 🅑 as shown in Fig. 16.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T soft assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assembly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.

Note : At this time, confirm that the T soft assembly is surely engaged with the T soft arm.

6) Referring to 1-1, mount the cassette compartment assembly.

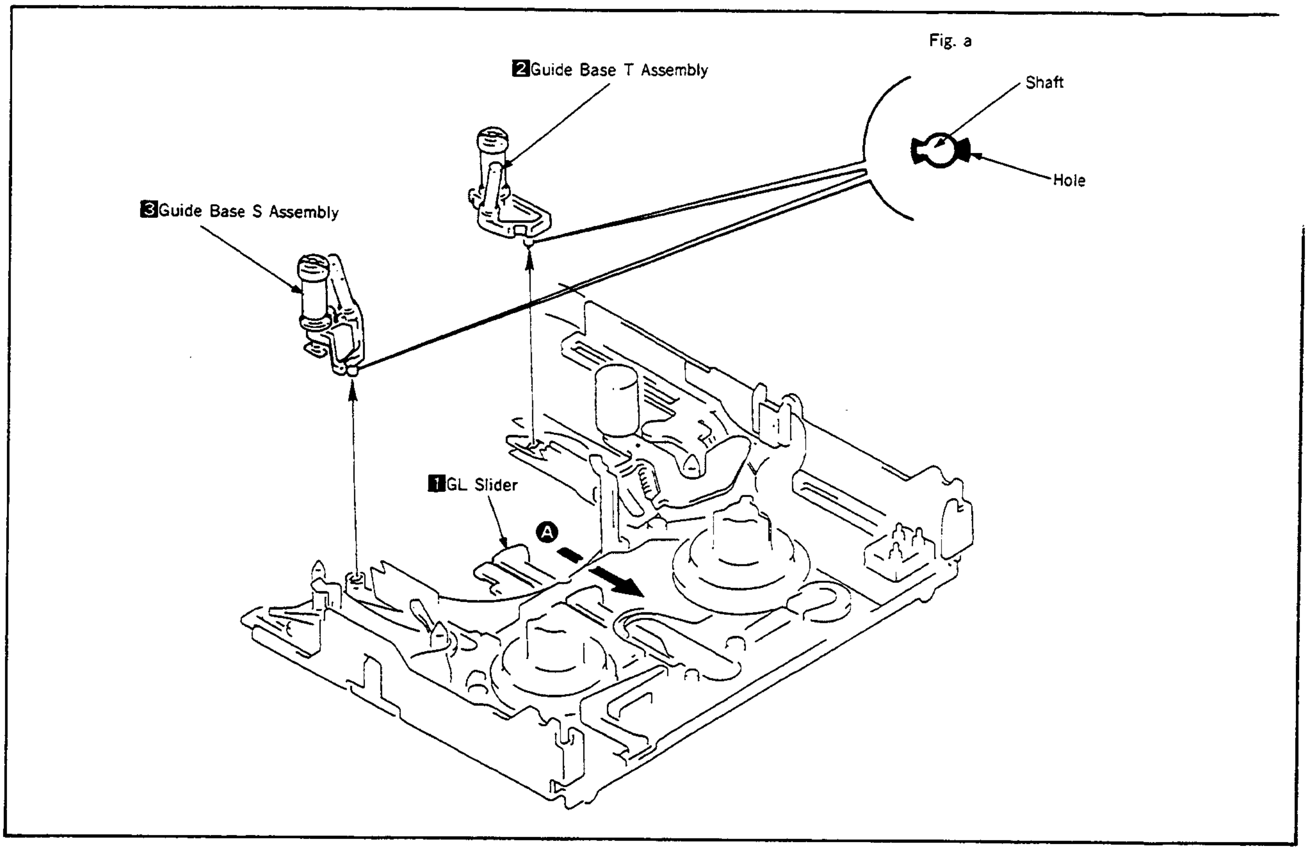


Fig. a
2 Guide Base T Assembly
Shaft
Hole
3 Guide Base S Assembly
1 GL Slider
A

Fig. 15

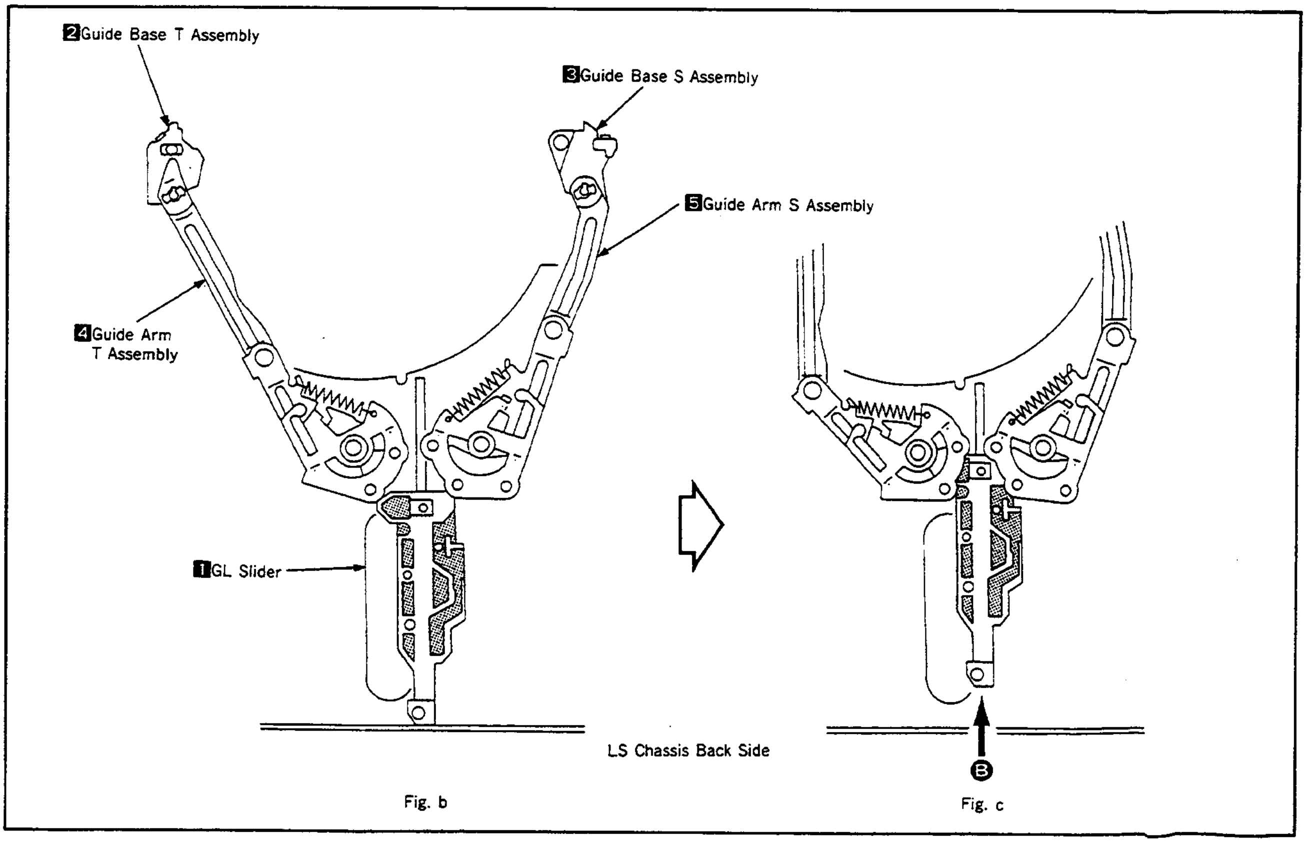

2 Guide Base T Assembly
3 Guide Base S Assembly
5 Guide Arm S Assembly
4 Guide Arm T Assembly
1 GL Slider
LS Chassis Back Side
B

Fig. b

Fig. c

Fig. 16

3 GUIDE ARM T ASSEMBLY AND GUIDE ARM S ASSEMBLY (Fig. 17)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-8, remove the guide base T assembly and guide base S assembly.
6) Remove lock washers ❶, then the guide arm T assembly ❷ and guide arm S assembly ❸ respectively from the back side of chassis.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T soft assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assmbly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

2. Mounting

1) Mount the guide arm T assembly ❷ and guide arm S assembly ❸, then fix them with a lock washer ❶ respectively.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T soft assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assembly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

2) Referring to 3-8, mount the guide base T assembly, guidebase S assembly and GL slider.
3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.
6) Referring to 1-1, mount the cassette compartment assembly.

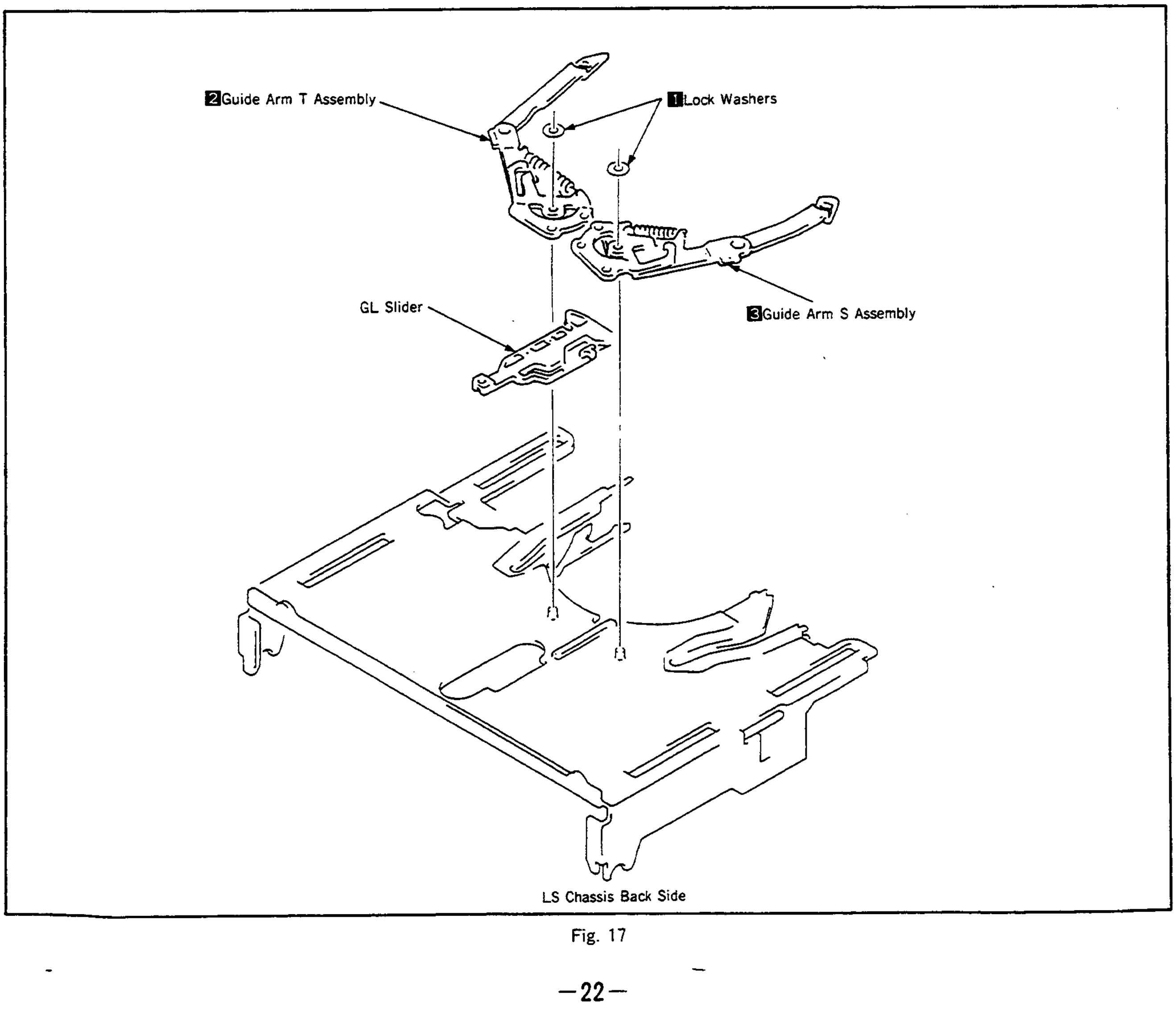


Fig. 17

3-10. SUPPLY REEL TABLE ASSEMBLY AND TG-1 ARM ASSEMBLY (Fig. 18)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-8, remove the guide base S assembly.
6) Remove a screw **1**, then the string **2** from the supply reel table assembly **3**. For easy removal of string block **4**, insert a flat-blade screwdriver into a groove ⓐ and push it up (Fig. a).
7) Remove the supply reel table assembly **3**.
8) Remove a tension coil spring **5**.
9) Turn the TG-1 arm assembly **6** up to a portion ⓒ of LS chassis hole in the arrow Ⓐ direction so that its tab ⓑ can be disengaged (Fig. b).

2. Mounting

1) Pushing the S soft brake **7** toward the arrow Ⓑ, mount thesupply reel table assembly **3**.
2) Route the string **2** under the TG-1 arm asembly **6**, andinsert the tab ⓑ of TG-1 arm assembly into the LS chassis hole ⓒ, then turn the TG-1 arm assembly in the reverse direction of arow Ⓐ (Fig. b).
3) Wind the string **2** along the groove of supply reel t assembly **3** (Fig. a).

Note : Do not curl the string extremely. Also, avoid adhesion oil, otherwise the image will be distorted.

4) Using the FWD B.T. adjusting driver (Ref. No. J-15), shift the string block **4** toward the arrow Ⓒ and tighten the screw **1** (Fig. a).
5) Engage the tension coil spring **5** to the chassis hook.

Note : Confirm that the string **2** is surely wound around the groove of supply reel table assembly **3** (Fig.a).

6) Referring to 3-8, mount the guide base S assembly.
7) Referring to 3-7, mount the LS chassis assembly.
8) Referring to 3-2, mount the protector base assembly.
9) Referring to 3-1, mount the Retainer, Gooseneck assembly.

Note : At this time, confirm that the T soft assembly is surely engaged with the T soft arm. (Refer to 3-5 Take-up Reel Table Assembly and Take-up Soft Assembly.)

10) Referring to 1-1, mount the cassette compartment assembly.

Note : Referring to 3-22, adjust the tension regulator position.

Note : Referring to 3-23, adjust the forward back tension.

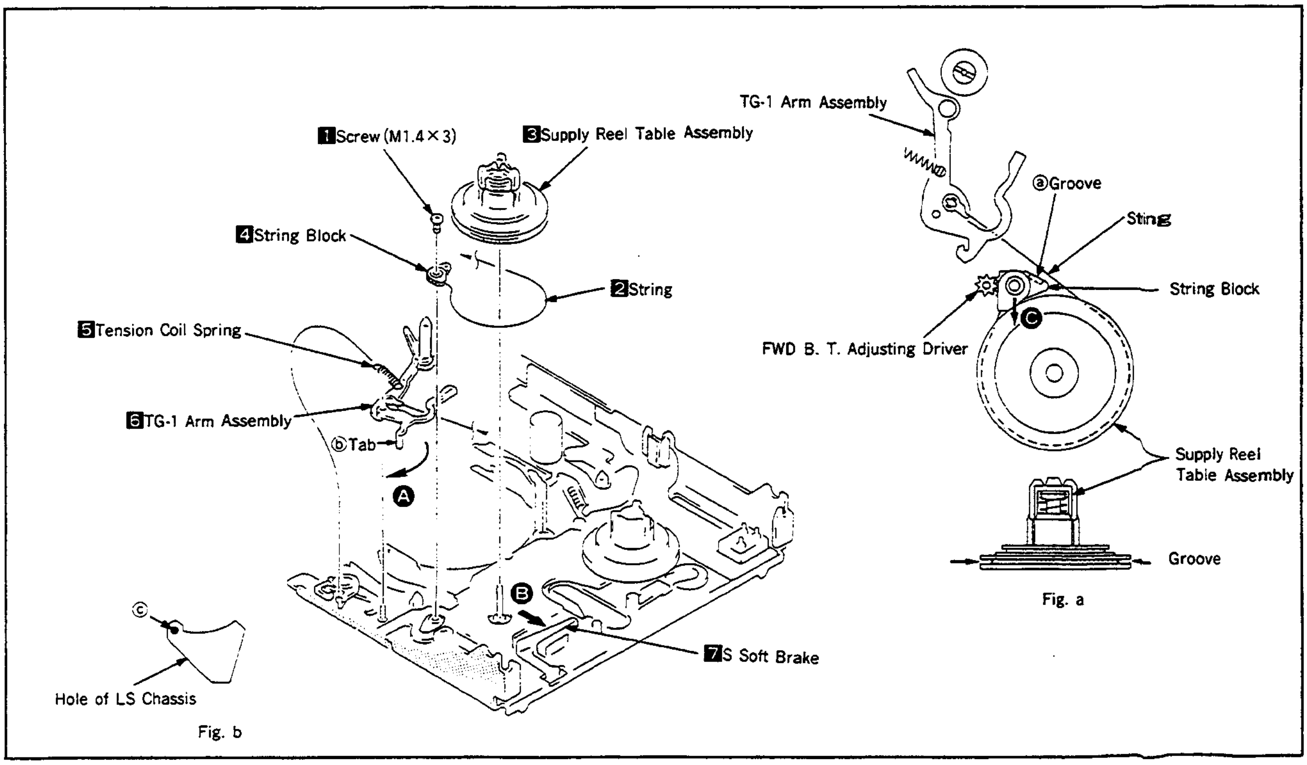

1 Screw (M1.4×3)
3 Supply Reel Table Assembly
4 String Block
2 String
5 Tension Coil Spring
6 TG-1 Arm Assembly
ⓑ Tab
Ⓐ
Ⓑ
7 S Soft Brake
ⓒ
Hole of LS Chassis
TG-1 Arm Assembly
ⓐ Groove
Sting
String Block
FWD B. T. Adjusting Driver
Ⓒ
Supply Reel Table Assembly
Groove

Fig. b

Fig. a

Fig. 18

3 . TG-2 ROLLER ASSEMBLY (Fig. 19)

1. Removal

1) Remove the TG-2 roller assembly ❶ .
2) Remove a compression coil spring ❷ .

2.Mounting

1) Insert a compression coil spring ❷ into the boss on chassis.
2) Rotate gently the TG-2 roller assembly ❶ until the screw is engaged.

3. Presetting of TG-2 Roller Height (Fig. a)

1) Rotating the TG-2 upper flange, adjust the height of bottom face of TG-2 lower flange from the top face of dowel on the mechanical chassis to 3. 3 ± 0. 05mm.

Note : After adjustment, perform 4. TAPE PATH ADJUSTMENT.

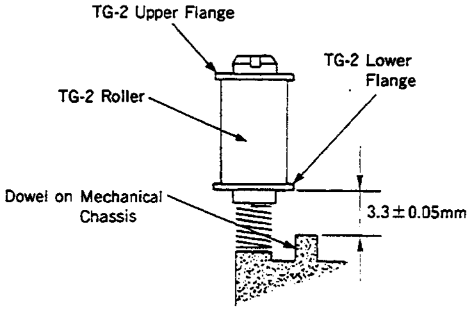

TG-2 Upper Flange
TG-2 Lower Flange
TG-2 Roller
Dowel on Mechanical Chassis
3.3±0.05mm

Fig. a

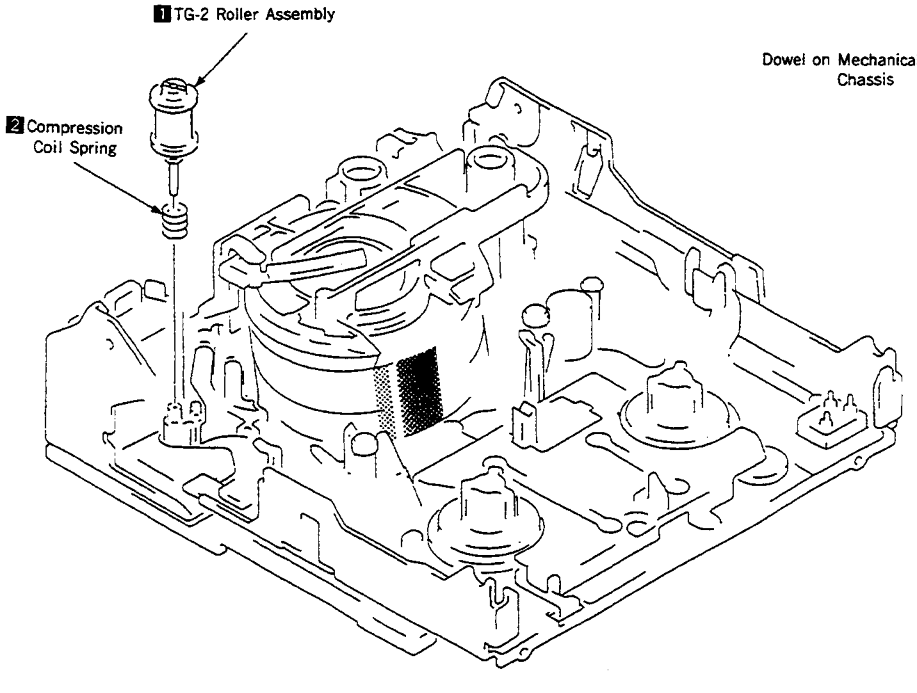

❶ TG-2 Roller Assembly
❷ Compression Coil Spring

Fig. 19

3-12. TG-7 ARM ASSEMBLY (Fig. 20)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Raise a portion ⓐ of TG-7 arm Leaf spring **1** in arrow direction with a flat-blade screwdriver or tweezers to disengage the tab from the chassis, then remove the TG-7 arm Leaf spring as shown in Fig. a.
6) Remove the TG-7 assembly **2** from the shaft of mechanical-chassis.

2. Mounting

1) Mount the TG-7 arm assembly **2** to the shaft of mechanic chassis.
2) Mount the TG-7 arm Leaf spring **1** to the mechanicalchassis.
   * Push in the tab of Leaf spring until it clicks into a detent ofchassis (Fig. a).
3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.
6) Referring to 1-1, mount the cassette compartmnet assembly.

Note : After mounting, perform 4. TAPE PATH ADJUSTMENT.

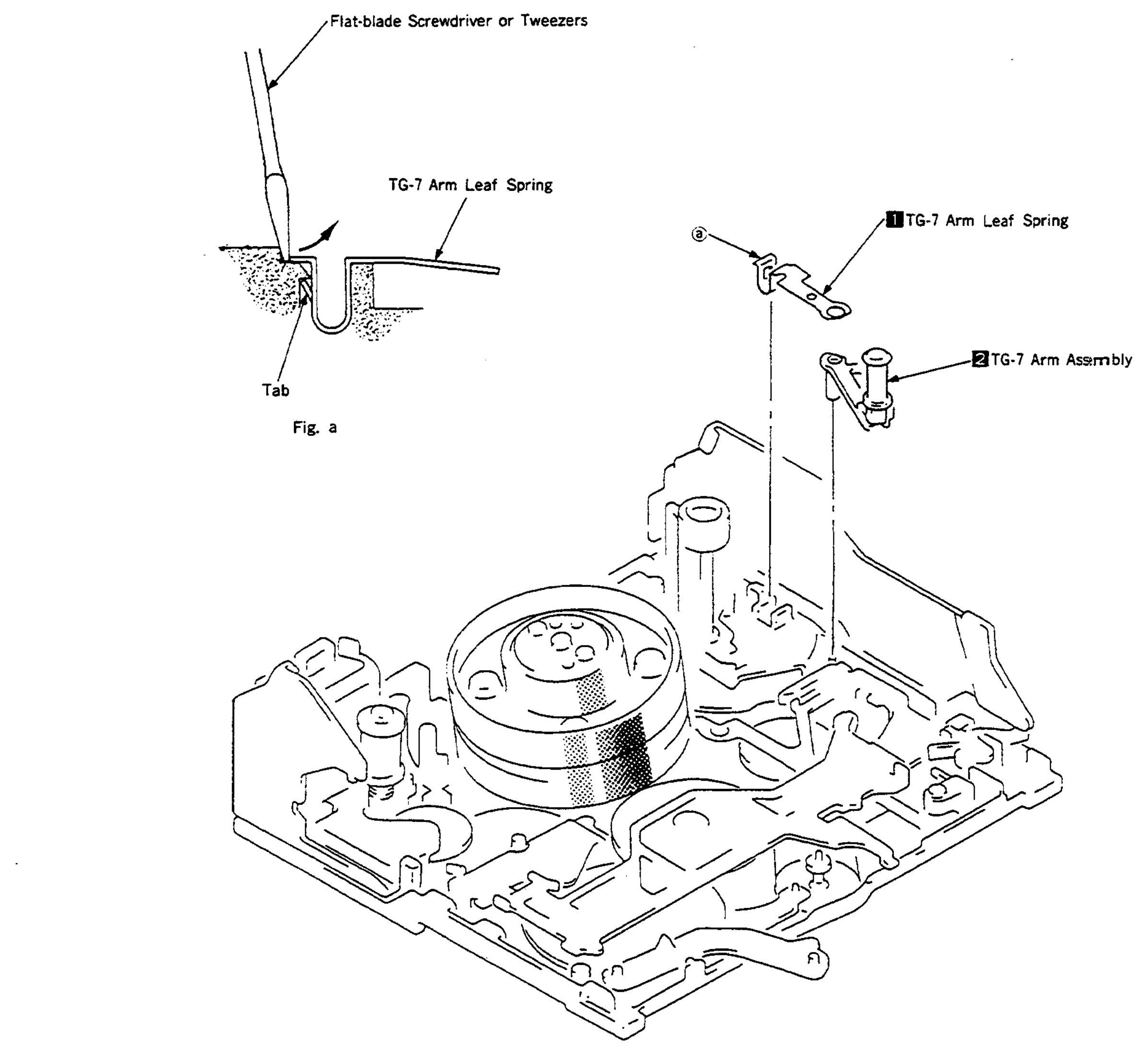

Flat-blade Screwdriver or Tweezers
TG-7 Arm Leaf Spring
Tab
ⓐ
1 TG-7 Arm Leaf Spring
2 TG-7 Arm Assembly

Fig. a

Fig. 20

3 . LM MOTOR ASSEMBLY (Fig. 21)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Select the LOAD mode (at the position where the FF arm assembly is not above the screw ❶).
6) Remove two screws ❶, then the LM motor assembly ❷.

2. Mounting

1) Aligning the dowel ⓐ of LM motor assembly ❷ with the hole ⓑ of mechanical chassis, mount the LM motor assembly with its hole ⓒ inserted into the mechanical chassis shaft ⓓ.
2) Tighten two screws ❶.
3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.
6) Referring to 1-1, mount the cassette compartment assembly.

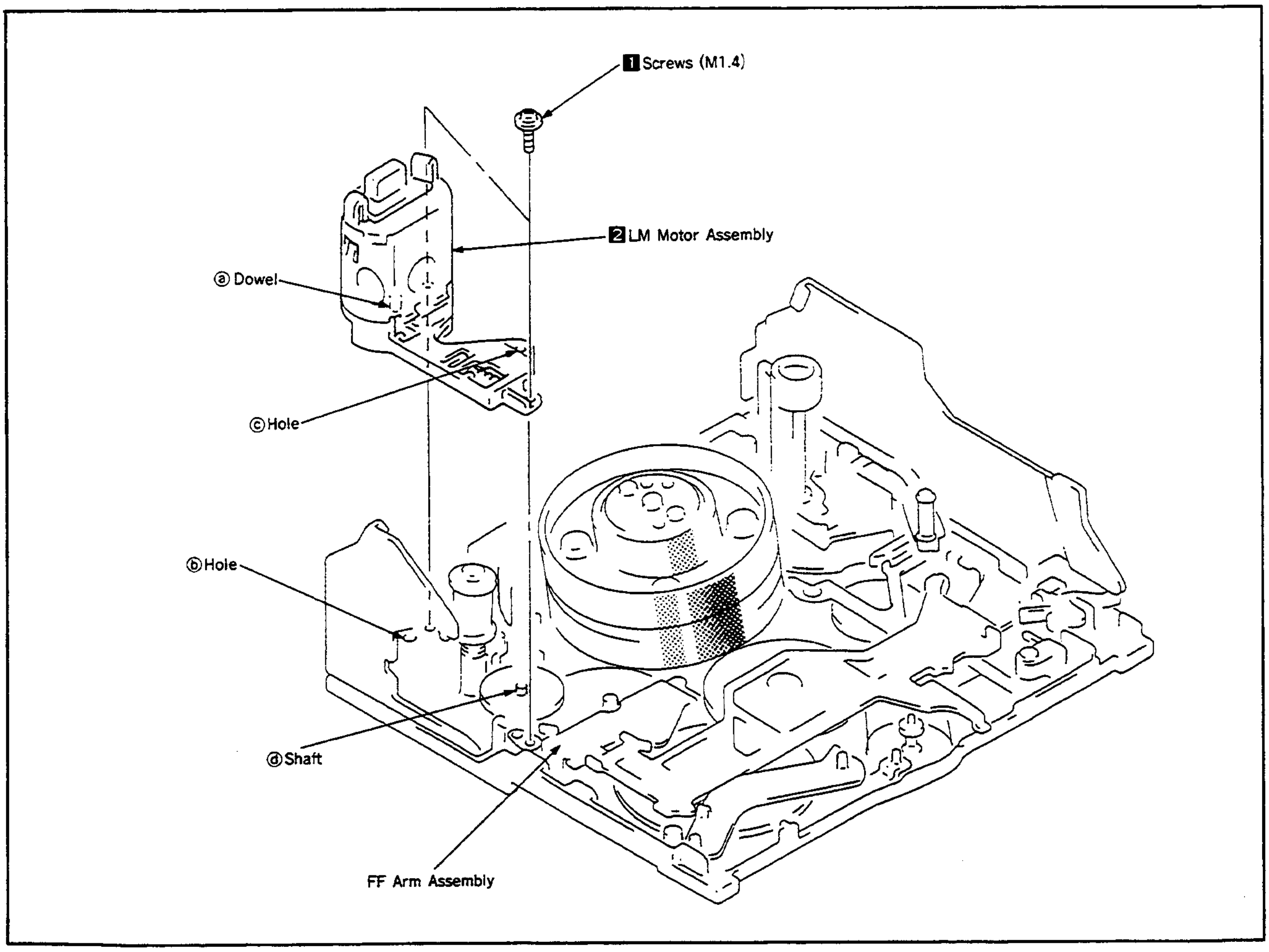


Fig. 21

3-14. LS ARM (Fig. 22)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the proctector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Remove the LS arm ❶ from the shaft of mechanical chassis.

Note : Take care not to drop the LS roller ❷.

2. Mounting

1) Mount the LS arm ❶ meeting with mechanical chassis sh and cam groove.

Note : Move the LS arm ❶ in arrow direction to confirm that the LS roller ❷ is surely inserted.

2) Referring to 3-7, mount the LS chassis assembly.
3) Referring to 3-2, mount the protector base assembly.
4) Referring to 3-1, mount the Retainer, Gooseneck assembly.
5) Referring to 1-1, mount the cassette compartment assembly.

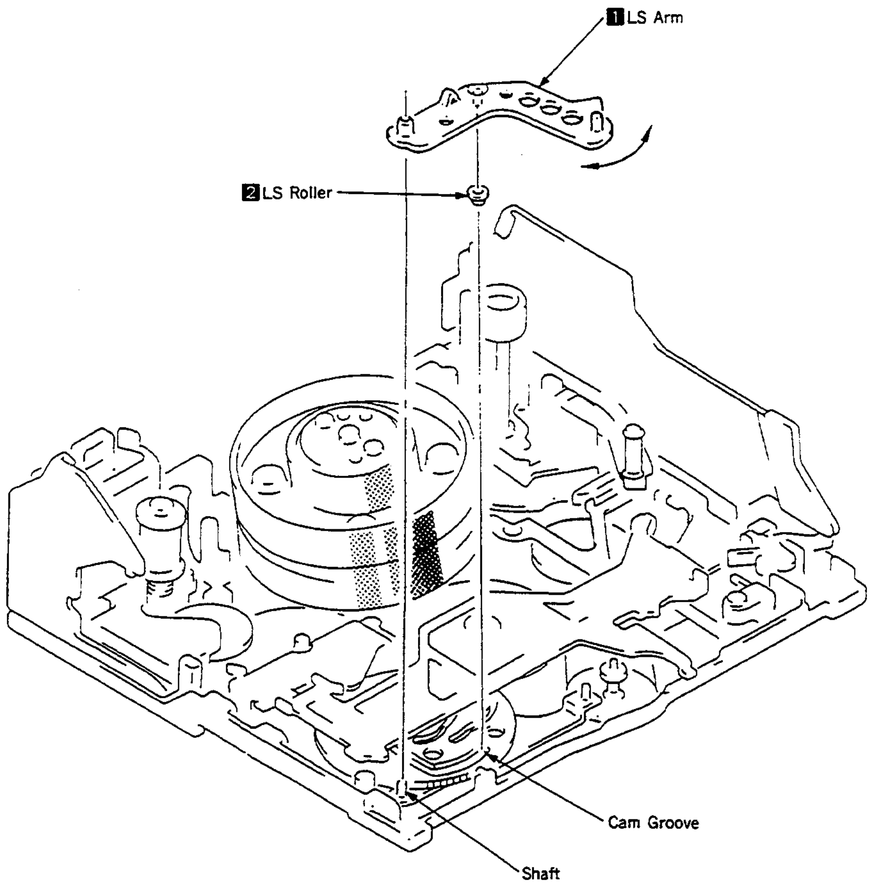


Fig. 22

. M SLIDER ASSEMBLY (Fig. 23)

Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Remove two screws ❶, then the gear holder ❷.
6) Remove two lock washers ❸, then the M slider assembly ❹.

2. Mounting

1) Mount the M slider assembly ❹, aligning long holes ⓐ and ⓑ of M slider assembly with shafts ⓒ and ⓓ of mechanical chassis, and a long hole ⓔ with shaft ⓕ of press arm assembly, and also shaft ⓖ with outer groove ⓗ of cam respectively.
2) Mount two lock washers ❸.
3) Mount the gear holder ❷ with its outserts ⓘ and ⓙ inserted into holes in the mechanical chassis.
4) Tighten two screws ❶.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 3-2, mount the protector base assembly.
7) Referring to 3-1, mount the Retainer, Gooseneck assembly.
8) Referring to 1-1, mount the cassette compartment assembly.

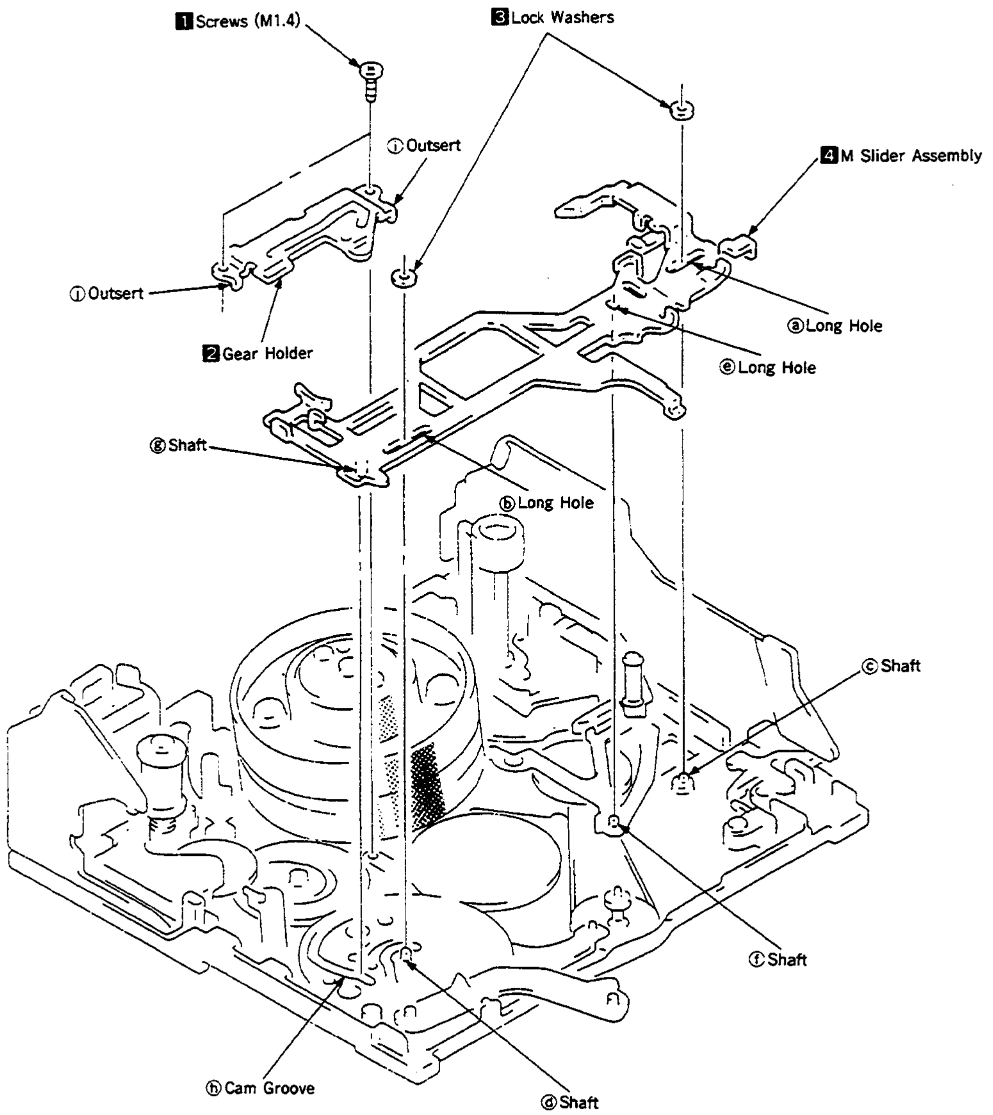

❶ Screws (M1.4)
❸ Lock Washers
ⓘ Outsert
❹ M Slider Assembly
ⓙ Outsert
ⓐ Long Hole
❷ Gear Holder
ⓔ Long Hole
ⓖ Shaft
ⓑ Long Hole
ⓒ Shaft
ⓕ Shaft
ⓗ Cam Groove
ⓓ Shaft

Fig. 23

3-16. PINCH PRESS ARM ASSEMBLY (Fig. 24)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-3, remove the drum assembly.
5) Referring to 3-7, remove the LS chassis assemvly.
6) Referring to 3-15, remove the M slider assembly.
7) Remove a lock washer ❶, then pinch press arm assembly ❷.

2.Mounting

1) Mount the pinch press arm assembly ❷, inserting its sh ⓐ into the cam groove ⓑ of HC drive arm, and hole ⓒ in the shaft ⓓ of mechanical chassis.
2) Mount the lock washer ❶.
3) After mounting, shift the pinch press arm assembly toward the arrow direction.
4) Referring to 3-15, mount the M slider assembly.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 3-3, mount the drum assembly.
7) Referring to 3-2, mount the protector base assembly.
8) Referring to 3-1, mount the Retainer, Gooseneck assembly.
9) Referring to 1-1, mount the cassette compartment assembly.

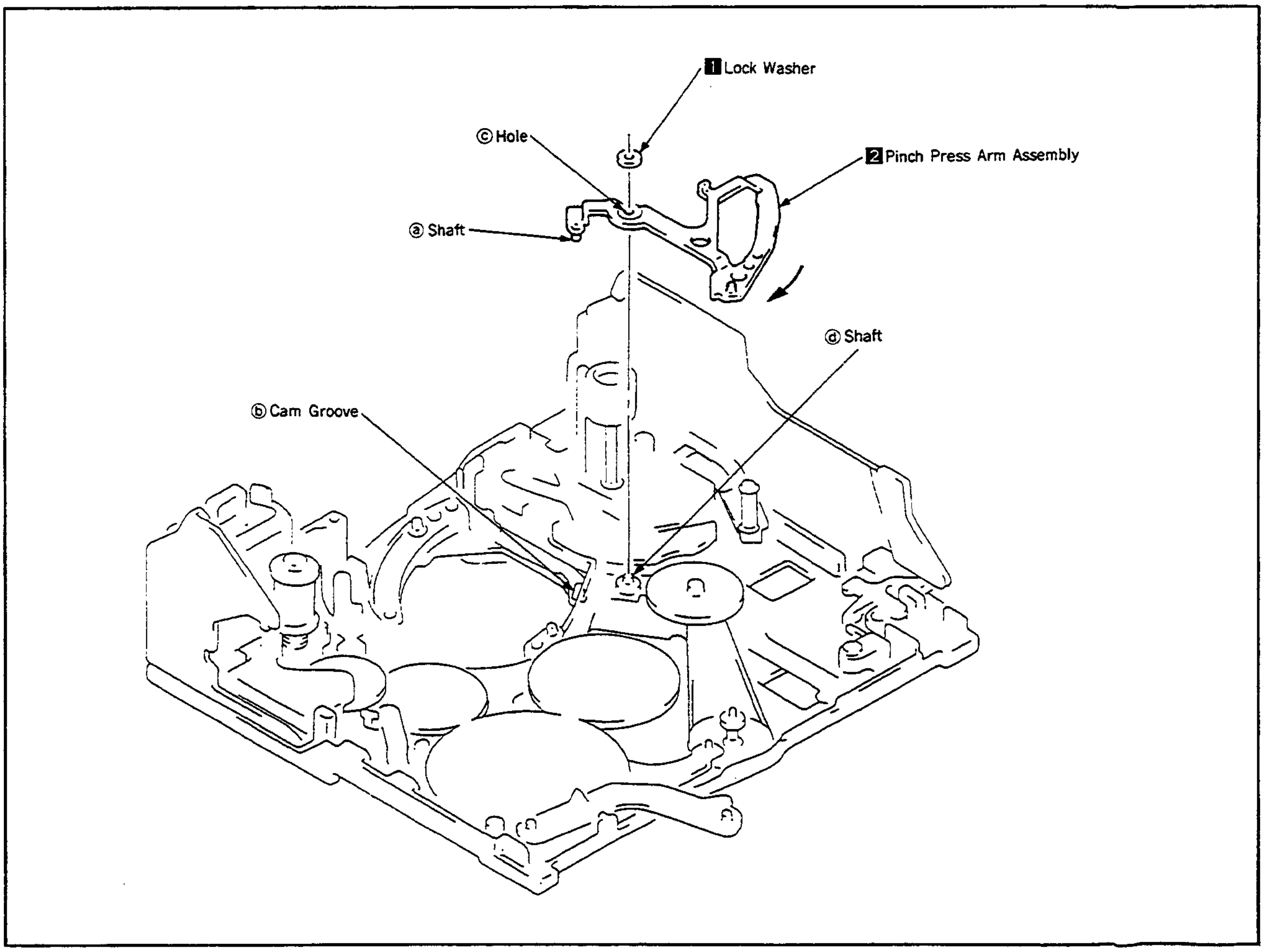


Fig. 24

. CAM (Fig. 25)

Removal

Referring to 1-1, remove the cassette compartment assembly.
Referring to 3-1, remove the Retainer, Gooseneck assembly.
Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-14, remove the LS arm assembly.
6) Referring to 3-15, remove the M slider assembly.
7) Remove the cam ❶.

2. Mounting

1) Referring to 3-13, remove the LM motor assembly.

Note : Take care not to allow grease of LM motor assembly to stick to the TG-2 roller assembly.

2) Mount the cam ❶, aligning its center hole with shaft of mechanical chassis, and the cam groove with the shaft of GL arm assembly. At this time , make sure that the ▲ mark on L gear B is aligned with that on the cam and also a recess is aligned with the phase aligning hole respectively as shown in Fig. a.

Note : Apply grease to the cam groove if it scarecely remains.

3) Mount the LM motor assembly.
4) Referring to 3-15, mount the M slider assembly.
5) Referring to 3-14, mount the LS arm assembly.
6) Referring to 3-7, mount the LS chassis assembly.
7) Referring to 3-2, mount the protector base assembly.
8) Referring to 3-1, mount the Retainer, Gooseneck assembly.
9) Referring to 1-1, mount the cassette compartment assembly.

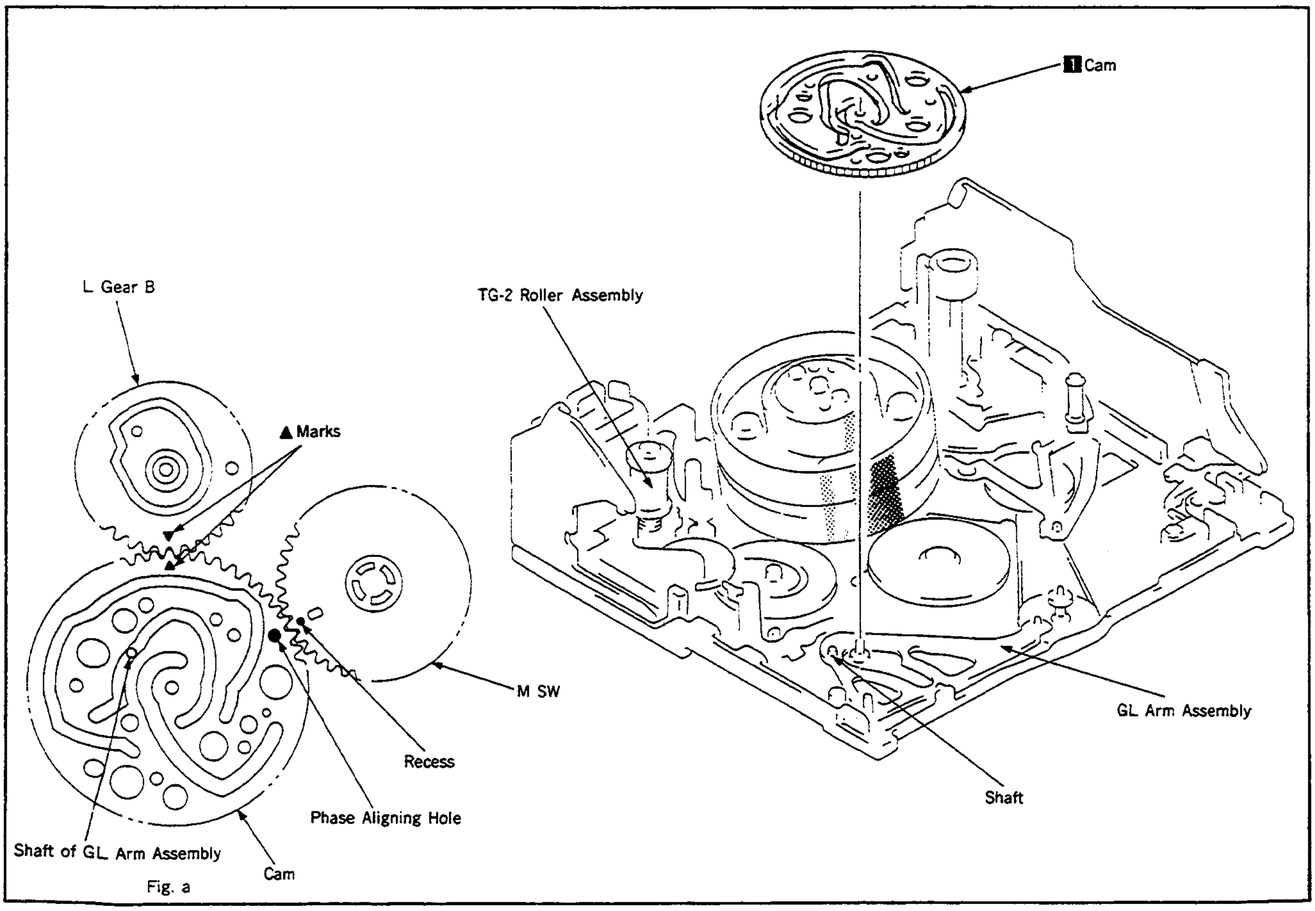


Fig. a

Fig. 25

3-18. GL ARM ASSEMBLY (Fig. 26)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-14, remove the LS arm assembly.
6) Referring to 3-15, remove the M slider assembly.
7) Referring to 3-17, remove the cam.
8) Remove the GL arm assembly **1**.

2. Mounting

1) Mount the GL arm assembly **1** with its hole ⓐ inserted in the shaft ⓑ of mechanical chassis.
2) Referring to 3-17, mount the cam.
3) Referring to 3-15, mount the M slider assembly.
4) Referring to 3-14, mount the LS arm assembly.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 3-2, mount the protector base assembly.
7) Referring to 3-1, mount the Retainer, Gooseneck assembly.
8) Referring to 1-1, mount the cassette compartment assembly.

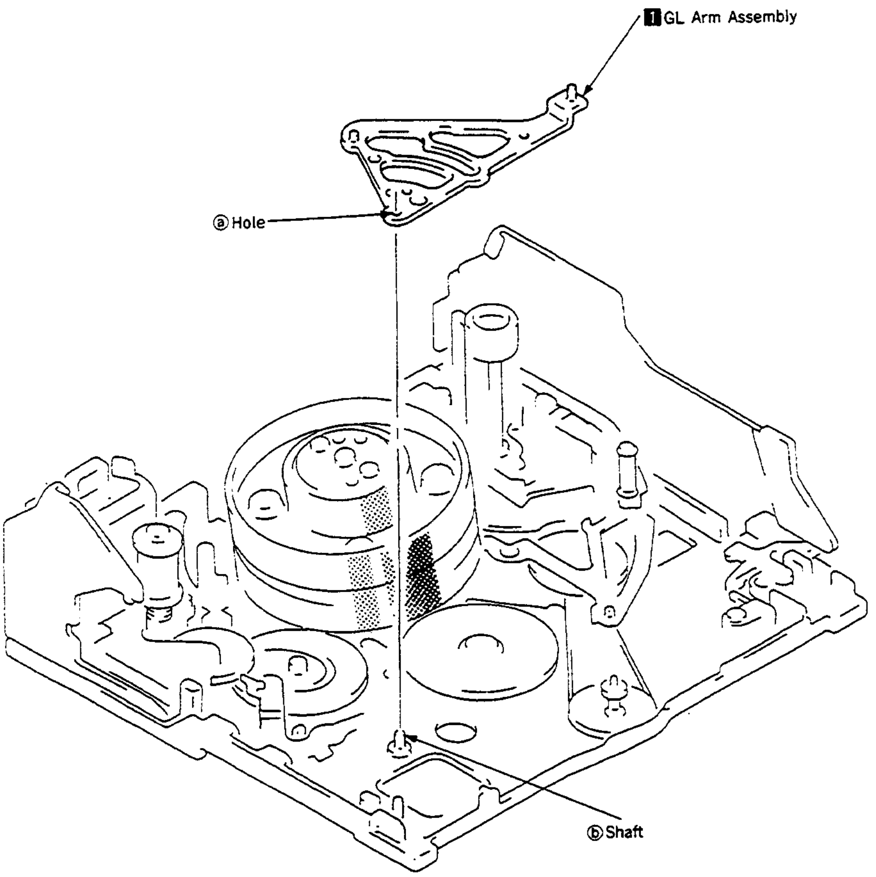


Fig. 26

9. L GEAR A AND L GEAR B (Fig. 27)

Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-14, remove the LS arm assembly.
6) Referring to 3-15, remove the M slider assembly.
7) Referring to 3-17, remove the cam.
8) Referring to 3-13, remove the LM motor assembly.
9) Remove the FF arm assembly **1**.
10) Remove the L gear A **2**.
11) Remove the L gear B **3**.

2. Mounting

1) Insert the L gear B **3** into the shaft of mechanical chassis. (At this time, the phase aligning mark ▲ should be faced toward the cam mounting shaft ⓐ.)
2) Insert the L gear A **2** into the shaft of mechanical chassis.
3) Mount the FF arm assembly **1** with its two shafts inserted into the cam groove of L gear B **3** and the hole of mechanical chassis.
4) Referring to 3-17, mount the cam.
5) Referring to 3-13, mount the LM motor assembly.
6) Referring to 3-15, mount the M sleder assembly.
7) Referring to 3-14, mount the LS arm assembly.
8) Referring to 3-7, mount the LS chassis assembly.
9) Referring to 3-2, mount the protector base assembly.
10) Referring to 3-1, mount the Retainer, Gooseneck assembly.
11) Referring to 1-1, mount the cassette compartment assembly.

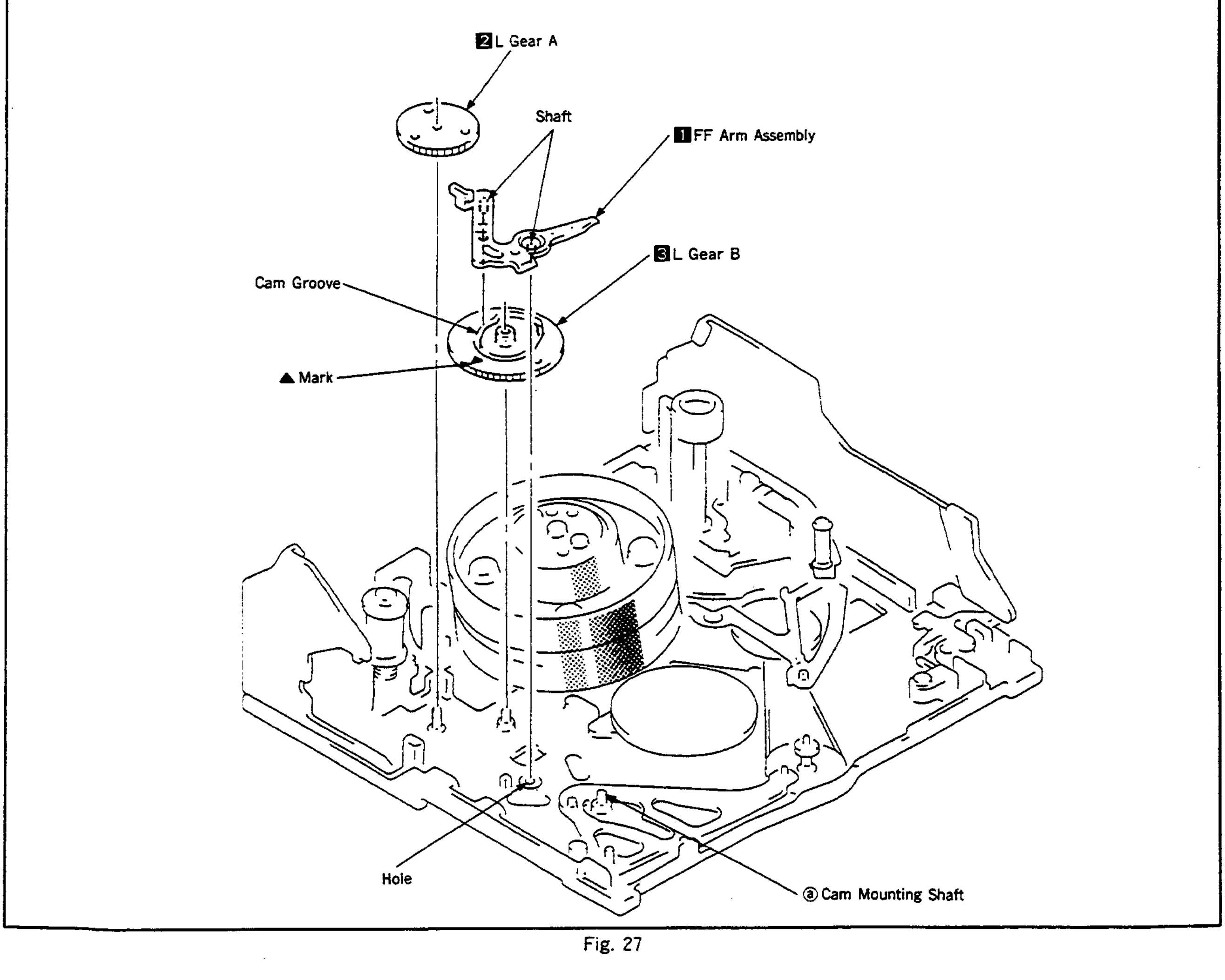


Fig. 27

3-20. RELAY PULLEY AND CHANGE GEAR ASSEMBLY (Fig. 28)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-3, remove the drum assembly.
5) Referring to 3-7, remove the LS chassis assembly.
6) Referring to 3-14, remove the LS arm assembly.
7) Referring to 3-15, remove the M slider assembly.
8) Referring to 3-17, remove the cam.
9) Referring to 3-18, remove the GL arm assembly.
10) Referring to 3-16, remove the pinch press arm assembly.
11) Remove a lock washer 1, then remove together the Change gear assembly 2, relay belt 3 and relay pulley 4.

2. Mounting

*Give one or two drips of oil to the conversion gear shaft and relay pulley shaft respectively. (Oiling range is under the neck as shown in Fig. a.)

1) Hooking the relay belt 3 to the relay pulley 4 and Change gear assembly 2, mount respective parts.
*At first, insert the relay pulley into the mechanical chassis-shaft, then the change gear assembly by engaging with the capstan motor gear.

Note : Take care not to damage the Change gear by the capstan motor gear.

2) Mount a lock washer 1.
3) Referring to 3-16, mount the pinch press arm assembly.
4) Referring to 3-18, mount the GL arm asembly.
5) Referring to 3-17, mount the cam.
6) Referring to 3-15, mount the M slider assembly.
7) Referring to 3-14, mount the LS arm assembly.
8) Referring to 3-7, mount the LS chassis assembly.
9) Referring to 3-3, mount the drum assembly.
10) Referring to 3-2, mount the protector base assembly.
11) Referring to 3-1, mount the Retainer, Gooseneck assembly.
12) Referring to 1-1, mount the cassette compartment assembly.

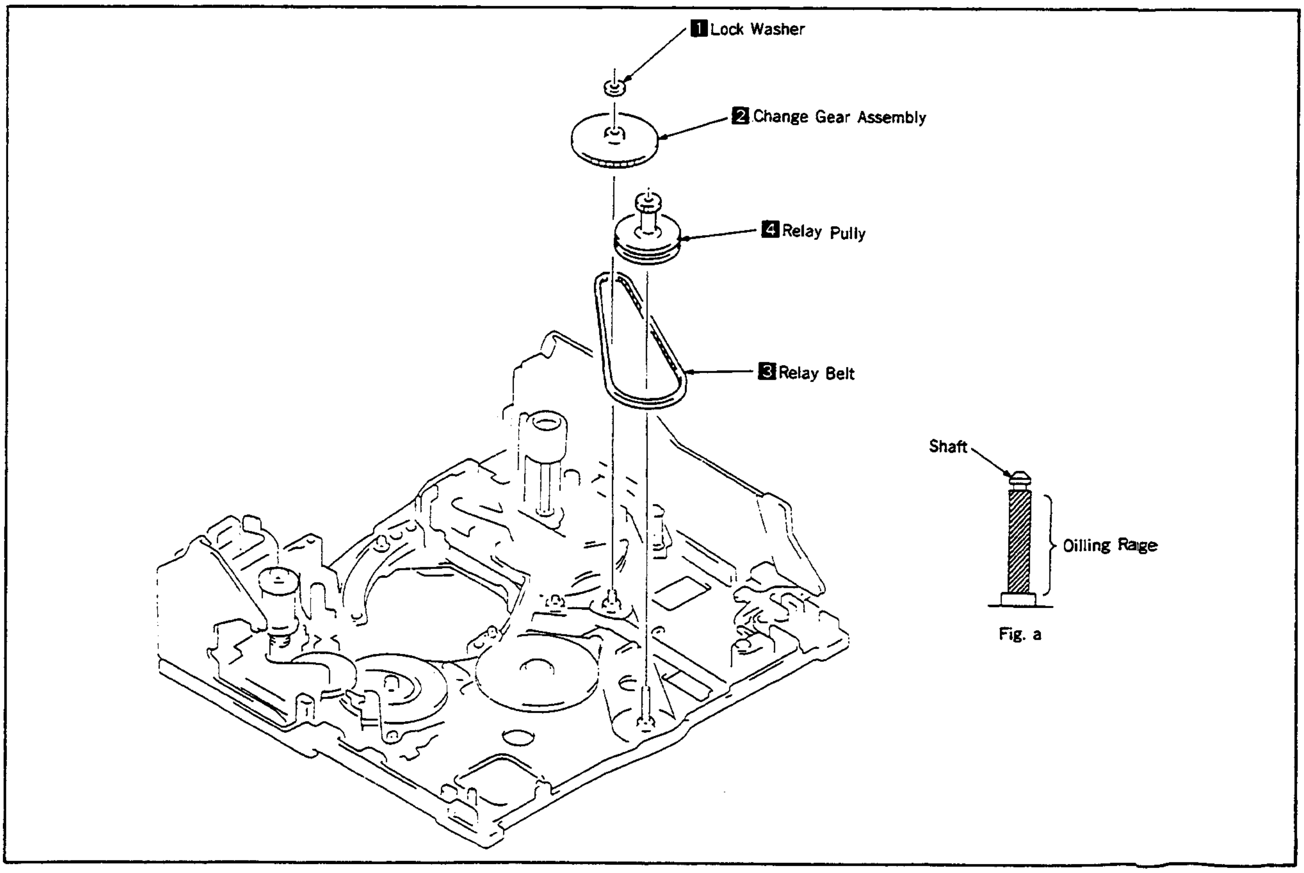


Fig. 28

3-21. ROTARY UPPER DRUM REPLACEMENT

1. Removoal

- If possible, make a recording before removal.

1) Remove the two screws ❶ (Fig. 29).
2) Mount the jig ❷ (Ref. No. J-10) with the two supplied screws ❸, then screw the attached hexagon socket screws ❹ to the jig ❷. The rotary upper drum ❺ will move upward and come off (Fig. 30).

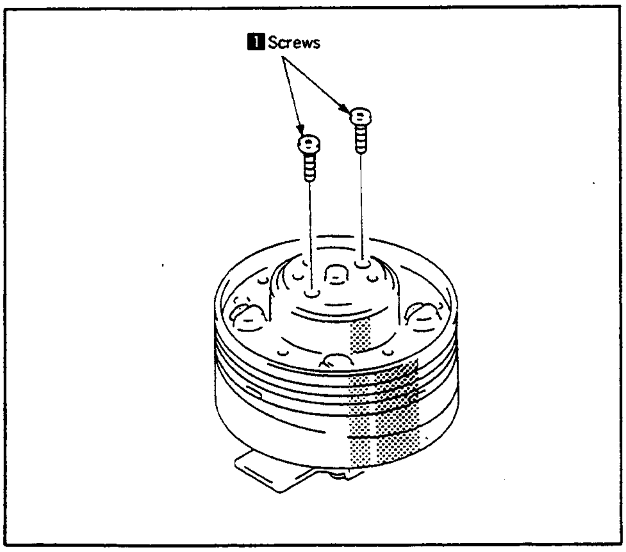


Fig. 29

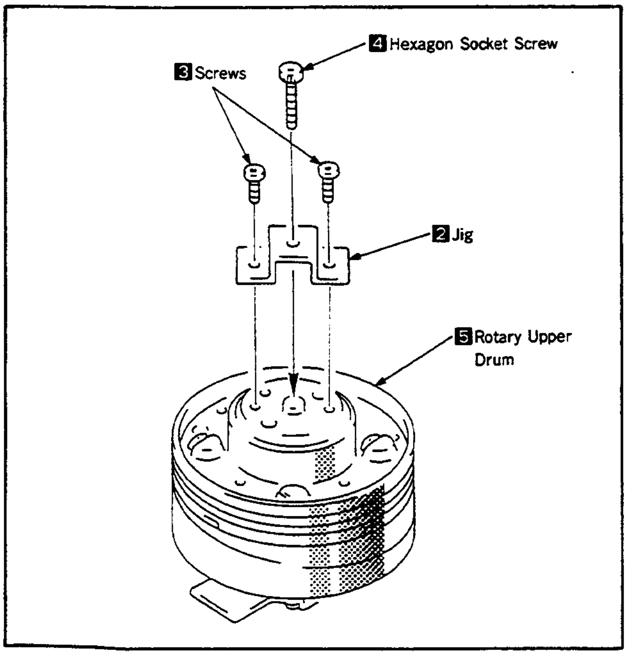


Fig. 30

2. Installation

1) Wipe clean the flange surface and the rotary upper drum ❺ surface that makes contact with it, and confirm that they are free from dirt and scratches.
2) Insert the jig ❻ (Ref. No. J-10) into the drum positioining hole, then set then set the rotary upper drum ❺ by passing the jig through its positioning hole ❼. (Fig.31)
3) Remove the jig ❻ and push down the rotary upper drum ❺ gently by hand. If it does not go all the way down, secure it temporarily by tightening the two screws ❶ alternately (Fig.29).
4) Insert the jig ❻ into the positioning hole ❼ again and confirm that it goes in smoothly. If it does not, loosen the two screws ❶, repeat step 2) of the Removal paragraph and restart the setting procedure.
5) Tighten the screws ❶.

Note : After installing, be sure to perform tape path adjustment as described in section 4.

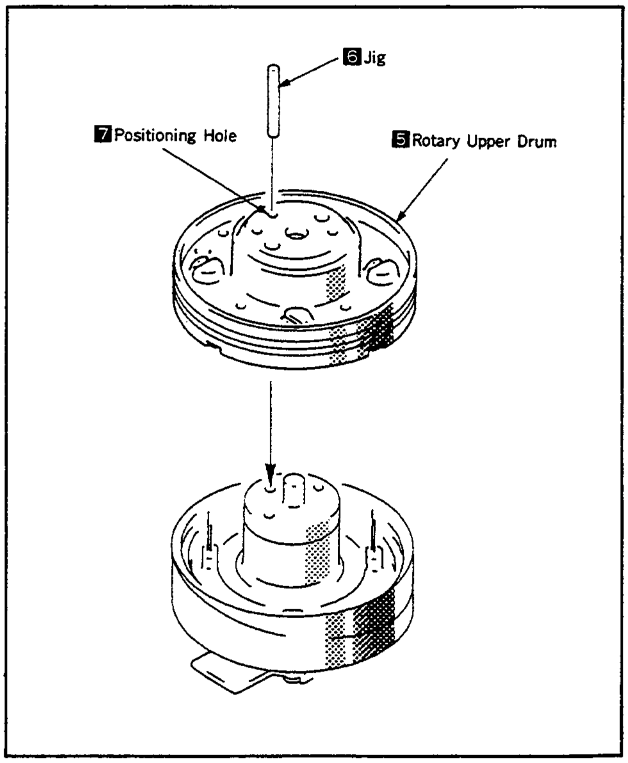


Fig. 31

3-22. ADJUSTMENT OF TENSION REGULATOR POSITION (Fig. 32)

1. Adjustment

1) Set a cassett tape and run the tape in the PB mode.
2) With the tape running, check that the distance from No.1 guide to No. 2 guide upper flange is 4.2 mm.
3) If they are not at the specified positions, perform adjustment in step 4) and subsequent steps.
4) Loosen the screw **1**.
5) If No.1 guide is located inside the specified position, shift the string block toward the arrow Ⓐ using the FWD B.T. adjusting driver (Ref No. J-15). Or, if it is located outside, shift toward the arrow Ⓑ.
6) Tighten the screw **1**.

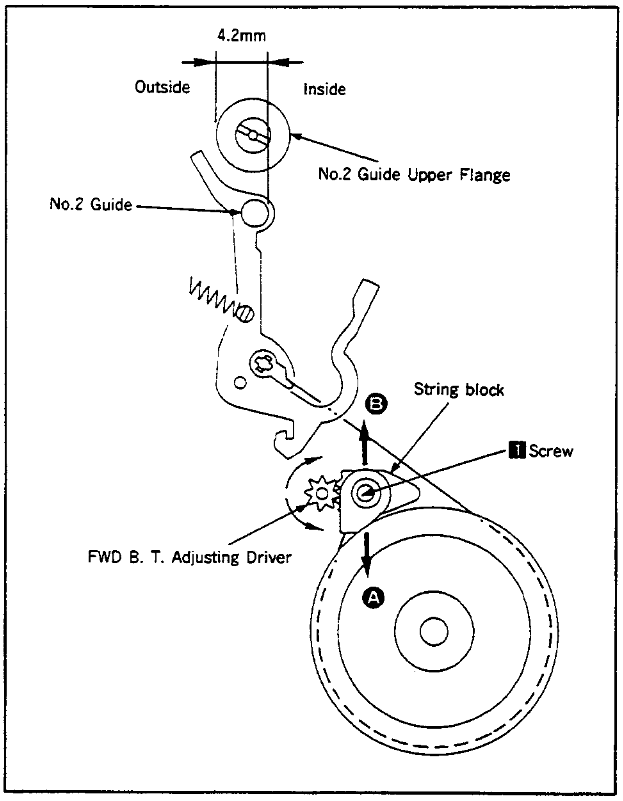

4.2mm
Outside
Inside
No.2 Guide Upper Flange
No.2 Guide
String block
Ⓑ
1 Screw
FWD B. T. Adjusting Driver
Ⓐ

Fig. 32

3-23. FWD BACK TENSION ADJUSTMENT (Fig.33)

1) Select the TEST mode 1 using the adjusting remote controller (Ref No. J-17).
2) Set the torque cassette (Ref No.J-10).
3) Select the FWD mode, and check that the torque of S reel table is 8.5 ~ 11.5 g · cm.
If it is out of standard, adjust the TG-1 spring hook position using the FWD B.T. adjusting driver (Ref No. J-15).

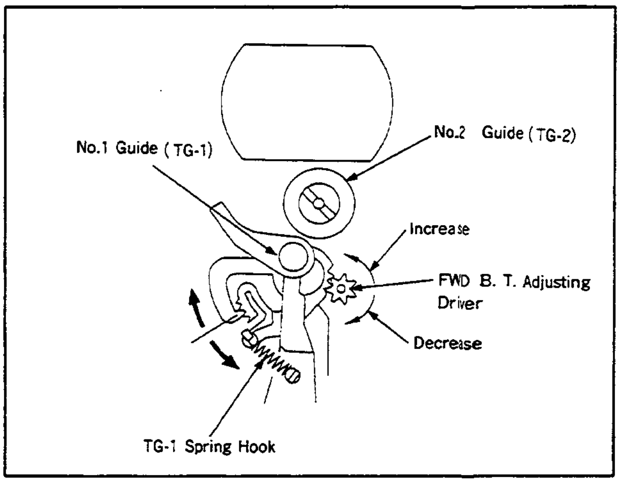

No.1 Guide (TG-1)
No.2 Guide (TG-2)
Increase
FWD B. T. Adjusting Driver
Decrease
TG-1 Spring Hook

Fig. 33

3-24. REEL TORQUE CHECK

1) Set the torque cassette.
2) Select the FWD mode, and check that the torque fluctuation center of T reel table is 7 ~ 17 g · cm
3) Select the REV mode, and check that the torque fluctuation center of S reel table is 25 ~ 39 g · cm.
4) Select the REV mode, and check that the torque of T reel table is 7 ~ 17 g · cm.
5) If the above data is not satisfied, the tension regulator band, T hard tab or T soft assembly will be faulty. Check them first, and if no abnormality is found, replace respective reel tables.

4. TAPE PATH ADJUSTMENT

The 8mm video system uses ATF (Automatic Track Finding) which instantaneously controls a tape running speed based on 4 types of pilot signals and performs high-precision tracking.
This does away a tracking control knob and allows accurate track tracing.
On the other hand, however, the ATF system has a problem in adjusting the tape path system. That is, if head tracing is out of order a little, the ATF automatically corrects it, which means that perfect adjustment cannot be done.
Therefore, in the A mechanism, the ATF system is forcibly operated to shift a tracking amount constantly (approx. 1/4) by setting the PATH mode with the adjusting remote controller (Ref No.J-16). So, fine tracking adjustment can be easily done. Also, the PATH mode setting varies with the model, and therefore, refer to the Service Manual.

Example) For CCD-FX410 series
Set the adjusting remote controller to the HOLD ON side.

1) Set PAGE : 1, ADDRESS : 00, DATA : 01 to cancel the PROTECT mode.
2) Set PAGE : D, ADDRESS : 01, DATA : 03 to select the PATH mode.

Note : Setting of PATH mode = TRACK SHIFT mode
If the adjusting remote controller (Ref No.J-16) is set to HOLD OFF once, then set to HOLD ON again after mode setting, the display of ADDRESS and DATA changes.

3) After adjustment is over, set DATA : 00, and press the PAUSE buttom on the adjusting remote controller (Ref No. J-16).

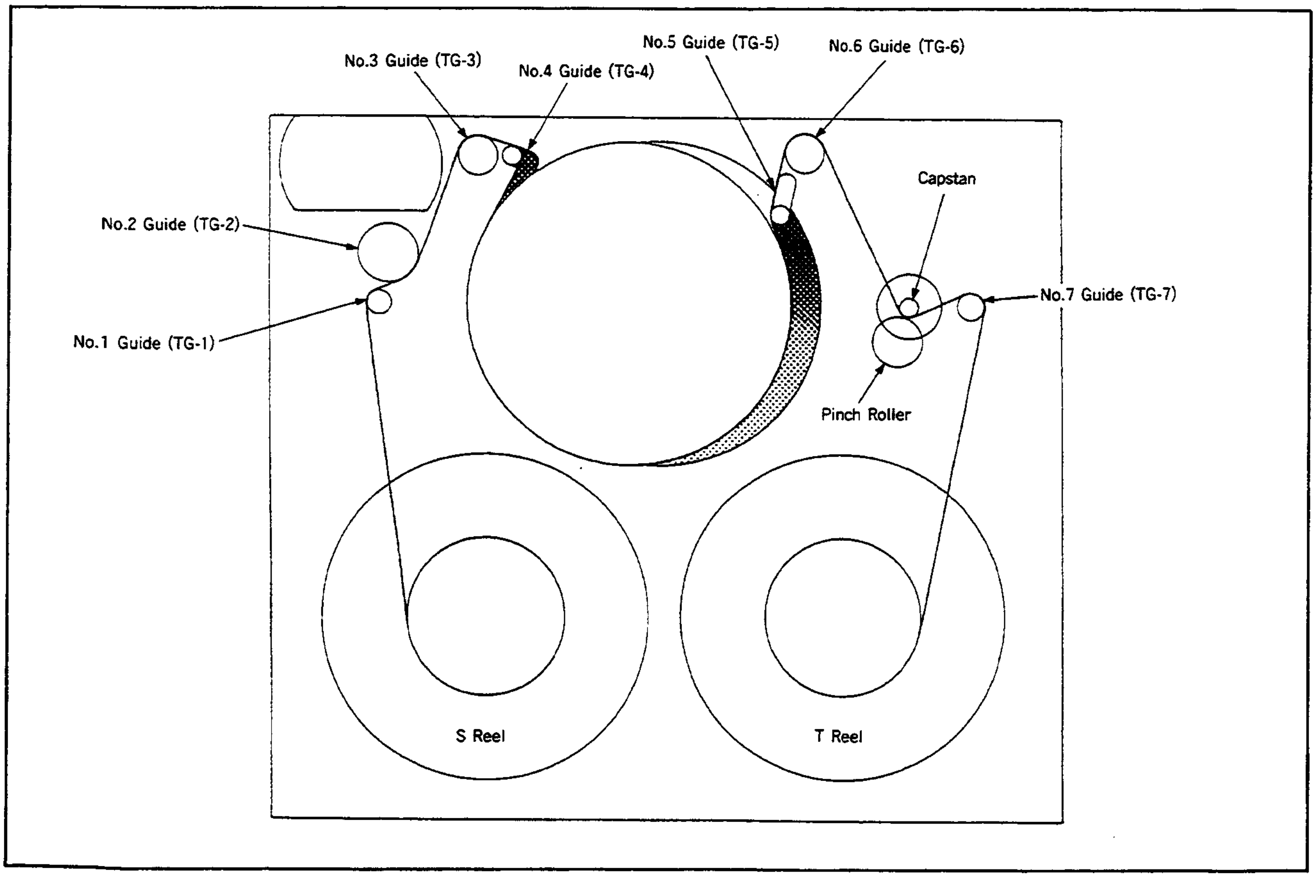


Fig. 34-A

[Note on Adjustment of No.7 Guide (TG-7)]

The height adjustment screw for No.7 guide (TG-7) is located at some distance from the guide (refer to Fig.41).

Therefore, when performing section 4-4. No.7 Guide (TG-7) Adjustment it is convenient to use the alignment tape for tracking (Ref. No. J-6), modified as follows, and perform adjustment in playback mode.

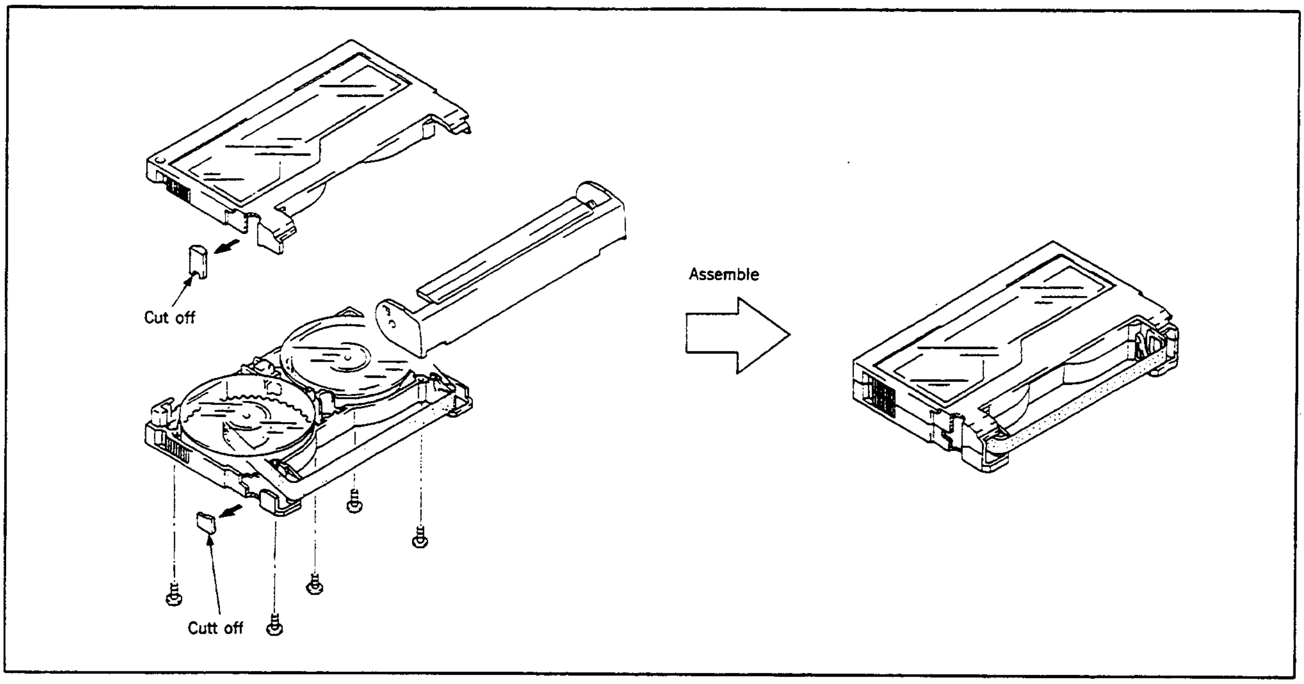


Fig. 34-B

4-1. PREPARATION FOR ADJUSTMENT

1) Clean the tape running surface (tape guides, drum, capstan shaft, pinch roller) (Fig. 34-A).
2) Set the PATH mode using the adjusting remote controller.
3) connect an oscilloscope to the check pin connector of the set.
   Example) For CCD-FX410 series
   CH1 : CN001 pin ③ (PB RF OUT) on CS-31 board
   CH2 : CN001 pin ④ (RF SWP) on CS-31 board
4) Play back a tracking alignment tape (NTSC : WR5-1N, or PAL : WR5-1C).
5) Check that a RF waveform is flat at the inlet and outlet of the oscilloscope (Fig. 35 ⓐ).
   If not flat, make adjustment with the procedures below.
   When the RF waveform is not flat at the inlet/outlet ; See Fig. 35 ⓑ and ⓒ.

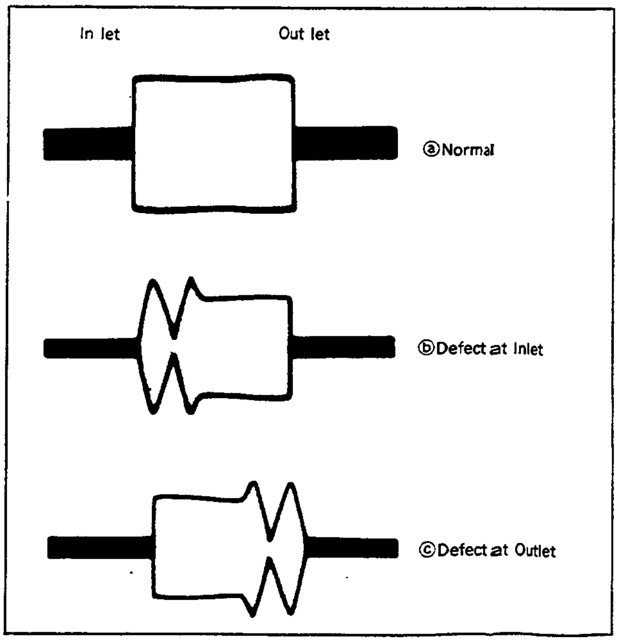


Fig. 35

4-2. TRACKING ADJUSTMENT (Fig. 36, 37)

1) Play back the tracking alignment tape.
2) Loosen the No.3 guide (TG-3) lock screw ❶ and turn the No.3 guide to flatten the waveform at the inlet.
3) Tighten the No.3 guide (TG-3) lock screw ❶ to lock the No.3 guide.
4) Loosen the No.6 guide (TG-6) lock screw ❷ and turn the No.6 guide to flatten the waveform at the outlet.
5) Tighten the No.6 guide (TG-6) lock screw ❷ to lock the No.6 guide. When this is done, make sure that the waveform does not change at the outlet.

Note : Be careful not to loosen the lock screw too much because the guide is easily moved.

: Take care not to allow interference between No.6 guide and drum when tightening the No.6 guide lock screw.

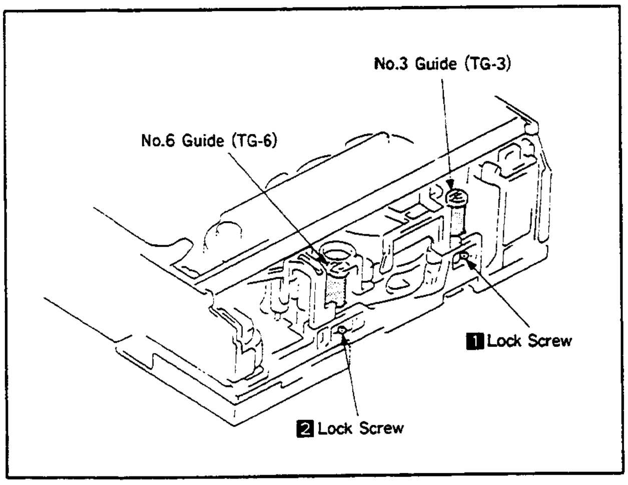


Fig. 36

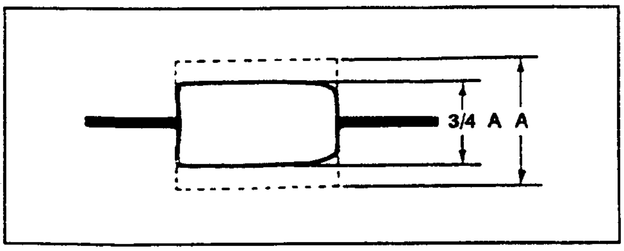


Fig. 37

4-3. No.2 GUIDE (TG-2) ADJUSTMENT

When the No.2 guide has been turned or replaced, perform height presetting before this adjustment.

4-3-1. No. 2 GUIDE (TG-2) HEIGHT PRESETTING (Fig. 38)

1) Rotating the TG-2 upper flange, adjust the height of bottom face of TG-2 lower flange from the top face of dowel on the mechanical chassis to 3.3 ± 0.05 mm.

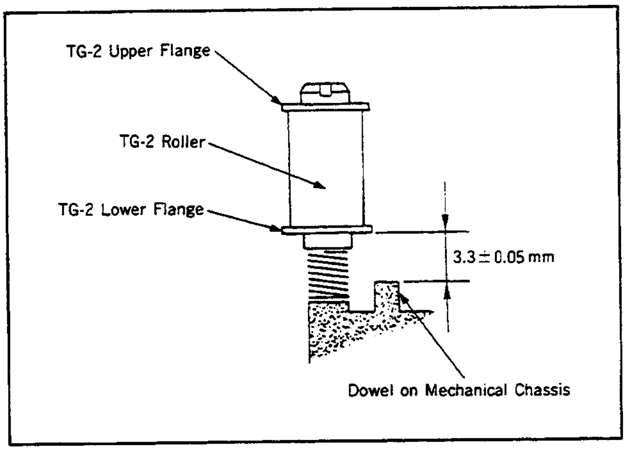


Fig. 38

[Reference]
This A mechanism is equipped with four adjustable guides (TG-2, 3, 6 and 7) . To raise or lower the respective guide rotate the corresponding adjustment screw as shown below.

Guide	Guide adjustment	Rotating direction of adjustment screw
TG-2, 3, 6	Raise	Counterclockwise
	Lower	Clockwise
TG-7	Raise	Clockwise
	Lower	Counterclockwise

4-3-2. No. 2 GUIDE (TG-2) ADJUSTMENT (Fig. 39, 40)

1) Play back a thin tape like the P6-120MP, etc. and set the REV mode.
2) Confirm that the tape is not bent at the lower flange 2 of the No.2 guide (TG-2) 1 (Fig. 39). If it is, turn the upper flange 3 of the No.2 guide (TG-2) clockwise with a screwdriver, lowering it until the tape is straightened.
3) Play back the alignment tape for tracking adjustment.
4) Perform tracking adjustment and trcking fine adjustment as described in sections 4-2.
5) In the track shift mode, CUE/REV the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds.
6) If the waveform is not normal (Fig. 40), turn the upper flange 3 of the No. 2 guide (TG-2) 1 90° counterclockwise and repeat step 5.
   Repeat steps 5) and 6) until a normal waveform is obtained.
   Then, confirm that the tracking waveform has not changed.
   If it has, perform fine adjustment of entrance side tracking and repeat step 5).

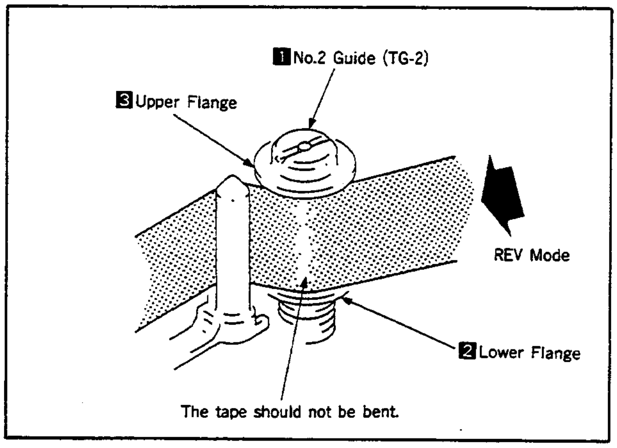


Fig. 39

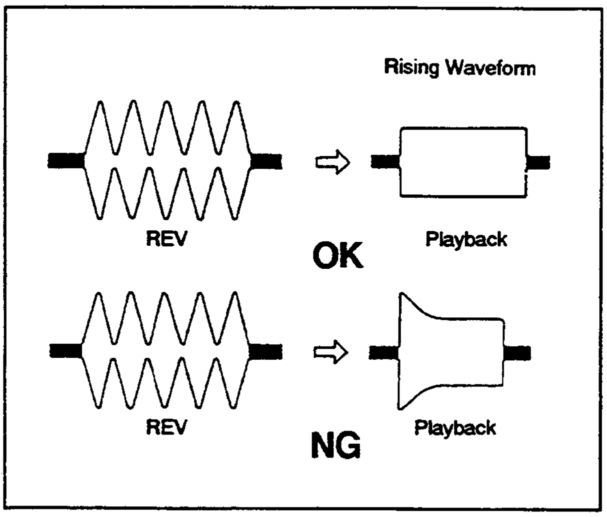


Fig. 40

4-4. No.7 GUIDE (TG-7) ADJUSTMENT (Fig. 41)

Note : This adjustment requires the No. 7 guide adjusting cassetetape (Fig. 34-B).

1) Play back the No.7 guide adjusting cassetetape and set the REV mode.
2) Confirm that the tape is not bent between the No.6 guide (TG-6) 1 and the capstan 2. If it is, turn the hight adjusting screw 4 of the No.7 guide (TG-7) 3 until the tape is straightened.
3) Set the playback mode again and confirm that the tape is not bent between the capstan 2 and the hight adjusting screw 4 of the No.7 guide (specification : 0.5mm or less). If the tape is bent beyond the specification, turn the No.7 guide (TG-7) 3 until bending is within the specification (0.5mm).
   If in the REV mode tape bending between the No. 6 guide (TG-6) 1 and the capstan 2 is 0.3mm or less, adjustment can be considered completed.

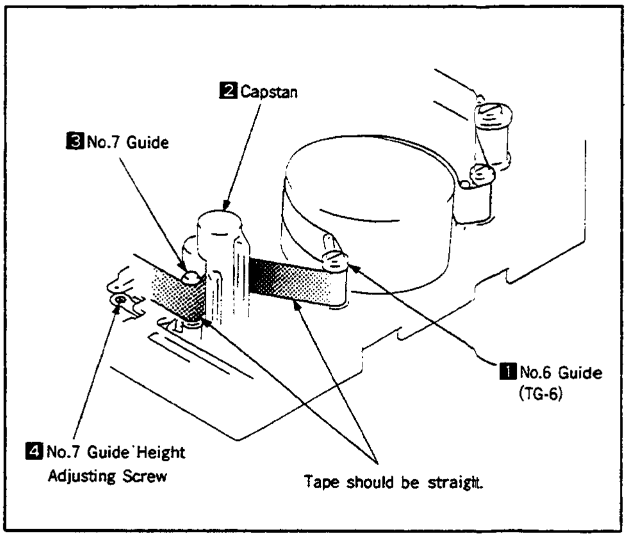


Fig. 41

4-5. CUE AND REV WAVEFORM CHECK (Fig. 42)

1) Play back the alignment tape for tracking adjustment and set the REV mode. Confirm that waveform peaks maintain a constant pitch of 5 seconds or more (Fig. 42). In case pitch is not constant, perform section 4-2.Tracking Fine Adjustment and section 4-4. No.7 Guide Adjustment.
2) Set the CUE mode. Confirm that waveform peaks still maintain a constant pitch of 5 seconds or more (Fig.42).
   Otherwise, perform section 4-2 Tracking Fine Adjustment.

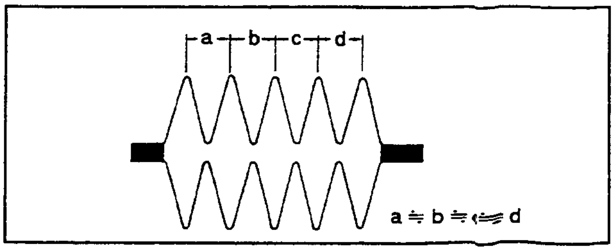


Fig. 42

4-6. CHECK AFTER ADJUSTMENT

4-6-1. TRACKING CHECK

1) Confirm that the amplitude of RF waveform is reduced to approx. 3/4 when the track shift mode is set (Fig. 43).
2) Then, confirm that the minimum amplitude value (E_{MIN}) is 65 % of the maximum value (E_{MAX}) or larger (Fig. 44).
3) Confirm that no large fluctuations occur on the waveform (Fig. 45).

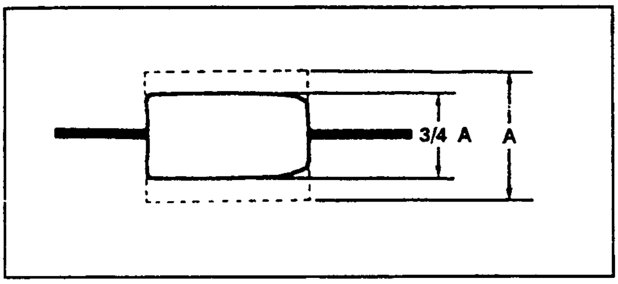


Fig. 43

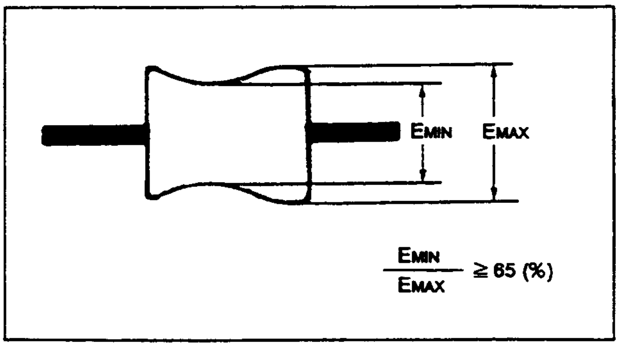

EMIN
EMAX
EMIN / EMAX ≧ 65 (%)

Fig. 44

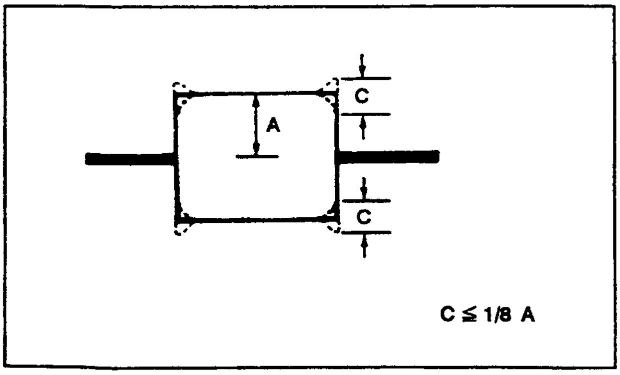


Fig. 45

4-6-2. RISING CHECK (Fig. 46)

1) Play back the alignment tape for tracking adjustment.
2) Cancel the track shift mode.
3) Eject the tape, then load it again.
4) Set the playback mode and confirm that the RF wave form rises flat within 2 seconds. Also confirm that the tape is not bent around the pinch roller.
5) CUE/REV and FF/REW the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds, Also confirm that the tape is not bent around the pinch roller.
6) Repeat steps 3) to 5) once more.

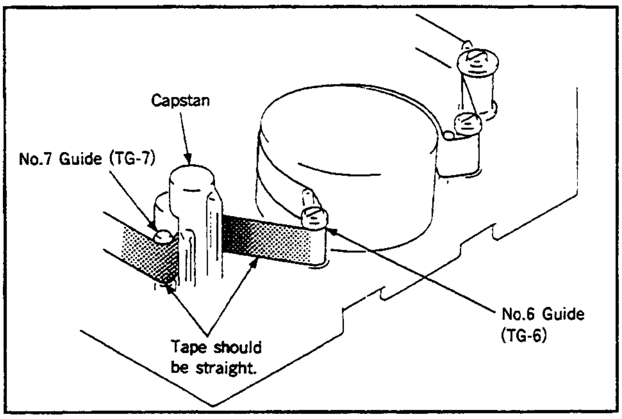

Capstan
No.7 Guide (TG-7)
No.6 Guide (TG-6)
Tape should be straight.

Fig. 46

4-6-3. TAPE PATH CHECK (Fig. 47)

1) Play back a thin tape like the P6-120MP (NTSC) or P5-90MP (PAL), etc. and confirm that no tape rising occurs, and that curling is less than 0.3mm, at the lower flange of the No. 2 guide , the upper flange of the No.3 guide, the upper flange of the No. 6 guide and the No.7 guide upper and lower flanges.
2) Confirm that no tape rising occurs and that curling is less than 0.3mm at the flange of all guide when pressing the FF button in the playback mode to set the CUE mode, or the REW button to set the REV mode.

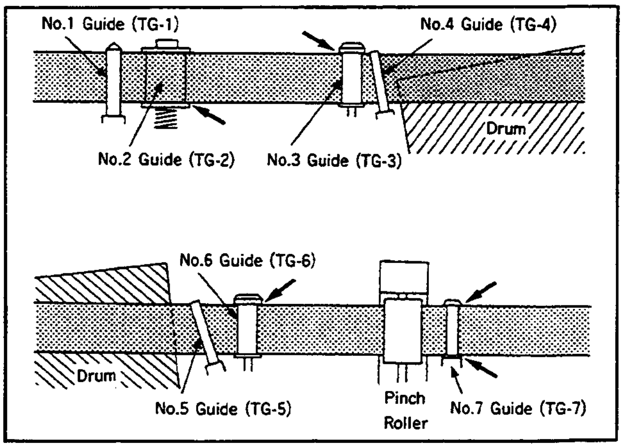

No.1 Guide (TG-1)
No.4 Guide (TG-4)
Drum
No.2 Guide (TG-2)
No.3 Guide (TG-3)
No.6 Guide (TG-6)
Drum
No.5 Guide (TG-5)
Pinch Roller
No.7 Guide (TG-7)

Fig. 47

8mm Video MECHANICAL ADJUSTMENT MANUAL IV

A MECHANISM

SUPPLIMENT-2

Video 8

⟨Connection of Mode Selector IV Conversion Connector⟩

In use of Mode selector IV conversion connector(J-6082-167-A), there are two different connecting methods depending on the model connected:

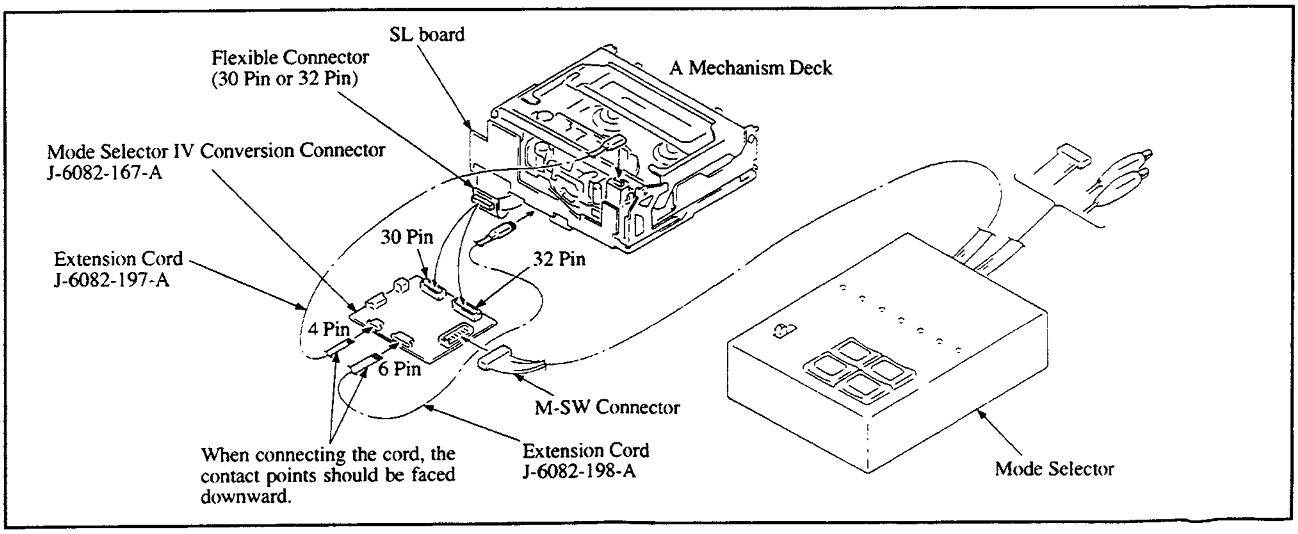
1. CCD-FX series

With the SL board mounted on mechanical deck, connect 30-pin(or 32-pin) connector to 30-pin(or 32-pin) Mode selector IV conversion connector.

CCD-FX300 series, FX400 series. FX500 series
→ 30-pin connector (FP425 or FP600)
CCD-FX700 series → 32-pin connector (FP477)

2. Models other than above

Connect the extension cord(J-6082-197-A) to loading motor 4-pin connector and extension cord (J-6082-198-A) to mode switch 6-pin connector in mechanical deck, then connect the other end of cord to 4-pin and 6-pin connectors of Mode selector IV conversion connector respectively, as shown below.


SL board
Flexible Connector
(30 Pin or 32 Pin)
A Mechanism Deck
Mode Selector IV Conversion Connector
J-6082-167-A
30 Pin
32 Pin
Extension Cord
J-6082-197-A
4 Pin
6 Pin
M-SW Connector
Extension Cord
J-6082-198-A
Mode Selector

When connecting the cord, the contact points should be faced downward.

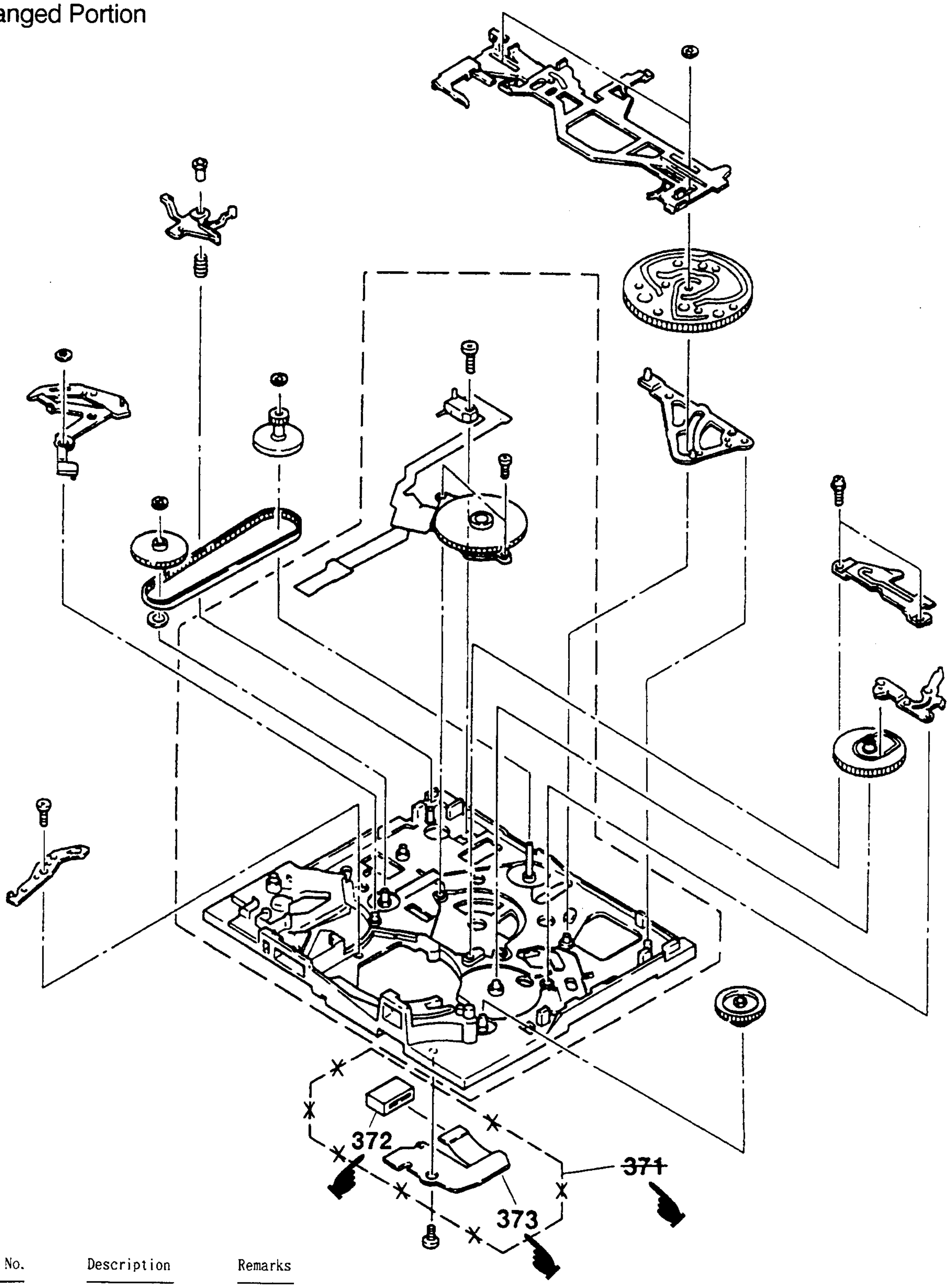
⟨CORRECTION⟩

P10. 2-4 Service jigs list

		Incorrect		Correct
J-15	FWD B.T adjusting driver	J-6082-182-A	➡	J-6082-187-A

MECHANISM CHASSIS ASSEMBLY (2)

☛ : Changed Portion



Ref.No.	Part No.	Description	Remarks
~~371~~	~~A-7040-311-A~~	~~FP-444 ASSY~~	☛
372	1-691-254-13	CONNECTOR, TRANSLATION 10P	☛
373	1-641-639-13	FP-442 FLEXIBLE BOARD	☛

9-973-199-84

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8mm Video MECHANICAL ADJUSTMENT MANUAL IV

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